



## **Diffusion of Telecommunications Services in a Complex Socio-Economic Context**

### **A Comparative Diffusion Analysis of the Fixed Line, Mobile and Internet Services in Pakistan**

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# Diffusion of Telecommunications Services in a Complex Socio-Economic Context

A Comparative Diffusion Analysis of the Fixed Line, Mobile and Internet Services in Pakistan



**PhD thesis 11.2011**

**DTU Management Engineering**

Abdullah Ismail  
August 2011

# **Diffusion of Telecommunications Services in a Complex Socio-Economic Context**

*A Comparative Diffusion Analysis of the Fixed Line, Mobile and  
Internet Services in Pakistan*

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### ***This work is dedicated to***

My loving parents, who taught me the initial words of wisdom to help me understand a world ... full of complexities and surprises!

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## Preface

This research aims at creating a detailed account on the diffusion of telecommunications services in a complex socio-economic context, taking Pakistan as a case study. The core research question of this thesis is to investigate why the successful experience of the rapid and an effective diffusion of mobile communications services in case of Pakistan couldn't be replicated in the cases of fixed telephony and internet services. The book investigates those major attributes which play a significant role in the diffusion of telecommunications services in a complex socio-economic and political context. Hence, the study reveals 47 major attributes (indicators) that fully explain why some telecom services successfully diffuse in the market; whereas the others fail to produce similar results. The thesis also conducts a detailed impact analysis of the diffused telecommunications services within the local context. In addition to that, the current research comes up with a list of strategic and policy recommendations for the relevant market players and authorities. Hence, this work presumably makes a significant contribution to an ongoing diffusion research, particularly in context of the diffusion of telecom services within a complex unit of adoption.

The empirical part of the research includes a significantly high number of interviews that were conducted from the key players of the local telecom market, and they essentially represented all the five major domains i.e. the supplier, policy, regulatory, user, and supporting domains. There were several workshops organized primarily in different universities across the country in order to collect a substantial amount of users' responses, using a well-structured questionnaire. The research makes an effective use of the detailed observations and extensive amount of readings of the published research and media reports in order to fully understand the real dynamics and complexities involved in the diffusion process. The use of mixed-methodology i.e. the careful application of both the quantitative and qualitative research methods further strengthens the reliability of the collected data and validity of the investigated facts.

It is assumed here that the validity of the derived results would be extendable to those cases that would have some degree of contextual resemblance with the presented case. Hence, the current study is likely to bring a fresh slant of perspective on the diffusion research in order to help other diffusion scholars in designing an analytical framework to conduct similar sort of studies on the other cases that would have similarities with the specific case that this thesis deals with. However, it is further assumed that most of the underdeveloped countries, as well as some of the developing nations would have a certain degree of social, economic, institutional, legal, historical and political resemblance with the presented case. Therefore the current research is believed to be highly beneficial and insightful for the telecom policy makers, regulators and suppliers in developing and aligning their tailored policies, regulations and strategies for the successful diffusion and sustainable growth of telecom services within any 'unit of adoption'; whether it is a private firm, social organization, public institution, a targeted market or a specific segment of the society.

# Chapter 1

## Introduction

### 1.1 The Central Theme of the Research

The rapid and smooth diffusion of telecommunication services has remained on top of the political and economic agenda for most of the countries especially in the developed economies primarily due to its perceived critical importance in their developmental projects and economic performance at the local, regional and national levels. But the diffusion of telecom services has never been a simple, smooth and linear process in most of the cases; particularly in case of the underdeveloped and developing nations, considering the patterns of the diffusion analysis of telecom services within these countries. The experience of conducting an in-depth diffusion analysis in Pakistan divulges the fact that the diffusion of telecom services in such a complex socio-economic context should be rather seen as a highly interactive, continual, adaptive and complicated process; which requires much deeper attention and focus particularly on behalf of the ‘focal actors’ such as the policy institutions, regulatory bodies and telecom network operators, while aiming at effectively engaging with the telecom users.

The diffusion process involves intertwined and intriguing interactions between the focal and mediating actors; and hence resulting in different ‘competing or counter networks’. Those ‘mediators’ who play a significant role in facilitating the diffusion of telecom services include ‘virtual’ network operators (e.g. MVNOs, resellers, and small ISPs<sup>1</sup> without owning their own network facilities), equipment manufacturers/vendors, content providers/aggregators, solution providers, consumer associations or social pressure groups, print and electronic media, politicians, bureaucracy, armed forces and security agencies, Non-Governmental Organizations (NGOs), standardization organizations, labor and trade unions, industrial associations and consortiums, financial bodies (e.g. banks, venture capital firms, private investors/‘business angels’), legal institutions (courts), and the academic and research institutions. An extensive dialogue with the relevant stakeholders reveals that they actually refer to a wide range of various internal and external factors for the relative successes and failures of the diffusion of telecom services in Pakistan.

The various actors and their associated competing networks pursue different and often conflicting social, political and economic agendas in order to promote and protect their own vested interests. To fully understand the reasons why some services smoothly and rapidly diffuse in comparison to other services, we need to go further in depth to comprehend the ongoing ‘translation’ processes through digging out the ‘multiple versions of partial truths’ or the ‘different shades of the reality’ held by a whole range of the involved actors and mediators. This would help us in exploring the formation of ‘interest alignment’ between the different ‘nodes’ (actors and mediators) through finding the multiple ‘linkages’ (communication channels) between these connecting nodes. When

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<sup>1</sup> MVNO and ISP stand for ‘Mobile Virtual Network Operator’; and ‘Internet Service Provider’ respectively

speaking to them in order to get their accounts on different issues, they all come up with various conflicting stories and different versions of the ‘truth’, as perceived by each of them as the original version of ‘reality’. Hence, the main purpose of this research is not to explore or identify the ‘truth’ itself, but to highlight and bring into the notice of the readers the inherent complexities and challenges faced by the researcher while struggling for finding the reality. It appears to be the case in the end of all investigative endeavors, that the reality is not something to be ‘objectively’ searched that could be presumed existing out there in the field to be fetched for the readers, but actually it is a ‘socially constructed’ entity made out of the multiple versions of ‘partial truths’ as essentially led or promoted by a range of social, political and economic interest groups in disguise of various ‘shielded covers’.

## **1.2 ‘Points of Departure’ for the Thesis**

The first point of departure for the current research is based on the observation that the past research on the diffusion of telecom services has been largely remained focused on different selected units of analysis from specific dimensions. However, the approach of focusing only on certain perspectives to cover specific dimensions of diffusion analysis is often found unable to fully grasp and effectively address this demanding topic holistically in order to deliver a detailed account on the issue, considering the scale of treatment as desirably required for the diffusion analysis in a complex socio-economic world. Much of the research has been observed following only one research paradigm or methodological approach due to being entangled with an unending academic discourse for being acknowledged as the ‘right’ approach to claim creating a reliable and valid research account; however, as mentioned above, such approaches often caught up by the trap of being too self-complacent with their own versions of holding ‘partial truths’. This thesis, however takes a different stand in its attempt to deal with this ongoing dilemma in order to delicately unfold the picture and the ‘different shades’ of reality. This thesis doesn’t follow in the ‘strict sense’ any particular research program (or paradigm); but instead it enjoys the synergy coming out of their interactive or simultaneous use due to their individual strengths at different occasions of research, by carefully applying these varying research techniques and methodologies in a good harmony.

The second point of departure for this thesis is the feeling that much of the past research on diffusion analysis has been based on an assumption of the presence of a certain degree of stability and transparency in the research field, a certain scale of explicitness and genuineness in communication, and a certain level of ‘determinism’ (with an expectation for controlled events and predictable outcomes) in a prevailingly well-functioning ‘systemic’ framework. However, these characteristics are either totally absent or extremely lacking in the research environment what this thesis refers as a ‘complex socio-economic context’. On the contrary, the referred ‘complex socio-economic context’ is known for its relatively high degree of chaos, an inherent uncertainty, a very low transparency, lack of coordination, institutional inefficiency and ineffectiveness, lack of basic physical infrastructure and living facilities (e.g. by and large missing the proper housing & town planning, facing clean water & sewerage related issues, poor conditioned roads & streets, and a frequent breakdown in power availability), missing an explicit and uniform parameter or mechanism to handle all cases on merit, lack of ‘social capital’, lack of explicitness with highly

vague and confusing patterns of communication, and the presence of multiple versions, stories and differing understandings of even the documented texts.

Actually, it seems like maintaining (deliberately) this fuzzy and chaotic scenario with confusing translations and blurring boundaries in the presence of an unheard noisy background, suits well to those whose interests lie in keeping the masses 'ignorant' and keeping them out of the 'power struggle' through strangling their democratic voices in the shaping and construction of technologies and in the subsequent markets' development; not only in terms of 'inscribing' the desired meanings to those constructed technological artifacts, but also in terms of the resulting benefits and impacts expected to be received by the users due to the differential access and an effective adoption of Information and Communications Technologies (ICT)<sup>2</sup>. Hence, in result of the widening 'digital divide'; the powerful groups are seen to be likely benefited in maintaining their 'status quo' and the existing social, political and economic divides between the masses and classes, in order to uphold their control over the society. Keeping these facts in mind, conducting a research aiming at the successful diffusion of technologically complex products such as the advanced telecommunications services would require a whole different set of skills, expertise and approach on behalf of the diffusion analysts (researchers), policy makers, regulators and the suppliers. Hence, it demands for being simultaneously equipped with both a high scale of 'robustness' and a high degree of 'sensitivity' towards the research environment and its inherent dynamic complexities.

The third point of departure for this thesis is based on the exposure that diffusion of telecom services cannot be studied in a linear way by just focusing on: the statistical dimensions (e.g. teledensity, growth indicators and market forecasting), technological comparisons, cross-country comparative benchmarking, affordability issue, market awareness challenges, 'digital divide' concerns, 'accessibility' or connectivity debates, the problems regarding 'usability', or conducting 'impact analysis'; in isolation with the other connected variables. This thesis debates that all these different dimensions together make the diffusion analysis a multifaceted research area, which incorporates the whole range of these debatable issues as well-integrated and intertwined parts of the unified subject of diffusion research. The thesis declines any attempt of isolating these issues from each other or trying to address one issue at a time through forcefully delineating boundaries between them. It is believed that adopting any such approach would result in inconclusive and partial solutions to addressing the core issues.

On the contrary, this thesis considers the diffusion of telecom services as an integrated research area that is presumed to be primarily composed of the three overlapping phenomena namely: the 'accessibility', 'affordability' and 'usability' respectively. 'Accessibility' defines the scale of connectivity of a society either at an individual household (personal) level or at the community (shared-mode access) level. The 'affordability' defines the purchasing power of a targeted community to comfortably subscribe and frequently make use the delivered telecom services. Finally, the 'usability' factor defines the market 'willingness' to pay for the delivered services, as it

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<sup>2</sup> Throughout the thesis, the term ICT has been used as synonymous to the Telecommunications services.

is essentially determined (after resolving the ‘affordability’ issue) by the market ‘readiness’ to understand the effectiveness and potential applications of the services in its own ‘context of usage’, and by having the minimum ‘competence or technical skills’ required to effectively make use of the services; through regularly conducting the after-use ‘impact analysis’ at an individual, group and societal level. This thesis assumes that through incorporating these three integrated elements of the diffusion research into the study would likely deliver a relatively more comprehensive account to the research on the diffusion of telecom services.

Hence, this whole debate demands a ‘renewed focus’ within the scholarly discourses at the academic, industrial, policy and regulatory levels, particularly within the diffusion of innovations’ research paradigm. It requires going further in depth to profoundly grasp and understand the underlying translations and interest-driven associations taking place between the focal actors and mediators during the diffusion process. This is as much a social and political process as much as it is considered to be a technical and commercial one; and hence their ability of mutual shaping of each other during the innovation development and its diffusion cannot be ignored. This is deemed to be crucial in order to better understand the inherent complexities of a complex socio-economic context; and to develop the required policy/regulatory vision and technological insight for effectively addressing those yet many unanswered research questions and innovation dilemmas.

### **1.3 Research Methodology**

As inspired by the above conceptual development, this thesis draws on different research methods and approaches as sources of inspiration or guidelines at different occasions of the research development. However, none of the research framework or any specific paradigm has been strictly followed; so that to allow a sufficient level of flexibility for effectively employing the idiosyncratic features and strengths of the different approaches and research methods whenever required, considering the scale of complexity this thesis had to handle with. This experience was also found useful in cross-checking the relative strengths and weaknesses of different approaches at different stages in order to provide an authentic account both in terms of keeping intact the reliability of collected data, and also the validity of the inferences made based on the data analysis. This research is primarily inspired by the methodological approaches of ‘Mixed-Methods’ (or ‘Triangulation’) and the ‘Grounded theory’ for the data collection and subsequent analysis; however the research also extensively makes use of other approaches such as the ‘Action Research’, ‘Actor-Network Theory’ (ANT), ‘Hermeneutics’ and the ‘Case study’ methods during the different parts of the research. For a detailed account on the research methodology in order to understand the adopted approach for this thesis, please refer to chapter 2.

### **1.4 Theoretical Recap**

The author’s theoretical review has identified eight mainstreams of literature on the subject, which have been classified here within the following broad categories accordingly.

- The Social Communication’s Perspective
- The ‘Systems of Innovation’ Perspective
- The Socio-Economic Impacts and Policy Implications’ Perspective

- The Comparative Benchmarking and Telecom (Policy/Regulatory) Reform's Perspective
- The Econometric Modeling and Technological Forecasting Perspective
- The Strategic & Business Modeling Perspective
- Managing Complexity and Integrating Change Perspective
- The Social Construction of Technology and Actor-Networks' Perspective

The thesis benefits from all of these different perspectives and various vantage points on this topic, and the author attempts to effectively make use of the terminologies and various concepts borrowed from these different highly inspirational schools of thoughts. For a detailed account on the 'literature review' for this thesis, please refer to chapter 3.

## 1.5 The Case Study

Pakistan was considered to be a suitable case for conducting this research due to the perceived highly complex socio-economic context that the Pakistani society essentially inherits in it; as explored by the author's conscious living experience for more than 2 decades, which was also added by the detailed observations and extensive readings made by the author about its culture, psychology, politics, economics, education, markets, industry, demographics, geography and range of other topics that were deemed to be relevant and extremely supportive in conducting the field research and subsequent analysis. In the presence of largely dysfunctional 'systems' within the Pakistani society in general; it's assumed to be impractical and probably counter-productive to only apply the 'systems approach' in this context, or merely relying on the 'analytical approach' due to the prevailing uncertainty, instability, lack of explicit communication, lack of systemic behavior, lack of mutual coordination between the institutions, and extremely lacking the transparency element because of an increasing level of corruption and mismanagement, as reported by many independently conducted survey reports and the published articles by different national and international organizations over the years.

The surprise element about the scale of 'complexity' in the Pakistan's context reveals that conducting a research of this nature would mean interacting with uncountable numbers of varying interests (where often the vested interests of individuals groups get preference over the communal or national interests); and hence, encountering a range of different translations as being advocated by those different interest groups in an attempt to protect their own specific interests during the technological and market shaping i.e. in the innovation development and its subsequent diffusion processes. Strikingly, in most of the underdeveloped part of the world and within the highly populated poor developing nations; the above mentioned socio-economic attributes can more frequently be found. In these societies the role of individual actors and their associated networks have been traditionally found more influential, controlling and powerful than in the egalitarian types of social, political and economic systems and societies. Hence, here the individual group's interests are often seen to be superseding and overruling the will of the masses.





Figure 1: The Widespread Diffusion of Mobile Services in Pakistan – Source: Wilson (2007)

### 1.5.1 A Brief Market Analysis

Pakistan has recently experienced a tremendous growth in the mobile sector during the past decade, especially since 2004, when the mobile market was fully liberalized with the entry of multiple foreign telecom operators in the sector, resulting in an extreme competition, and unparalleled market growth from previously 5 million to above 109 million subscribers (est. June 2011 with a cellular teledensity now above 65%) just in that short span of time. However, on the other hand, the success story of mobile services couldn't be replicated in case of fixed line telephony (including both landline and fixed-wireless solutions) and internet services (including both the dialup modem based narrow band, and the DSL<sup>3</sup>, wireless and optical fiber based broadband solutions). There is a gradual decline in landline telephony (currently 3.4 million subscribers) whereas there is a moderate growth in fixed-wireless services (2.8 million connection); and hence making the total number of fixed line connections still around just 6 million (est. June 2011). The case of internet presents even a bleak picture where the previously dominating dialup modem based narrowband access (with 18 million users)<sup>4</sup> is now reportedly diminishing; whereas the total numbers of broadband users have been reported<sup>5</sup> still around 1.4 million (est. March 2011). The network deployments of modern broadband solutions (such as HFC, WiMAX, FTTH and EvDO)<sup>6</sup> have been seen so far limited only to the urban areas (metropolitan cities), and hence their subsequent usage has also been noticed mainly among the relatively upper social and economic classes or segments of the society; whereas the vast majority (above 90% of total population) is still totally unaware of the basic usage skills, different useful and relevant applications and the potential impacts of these modern ICT services with respect to their life in terms of their social, educational, economic, and political uplift and empowerment.

This thesis aims at studying the factors and the diffusion attributes that have been reasoned for the differential growth of various telecom services in Pakistan; which is considered here as a 'unit of analysis' for conducting a sector-specific case-study and for the subsequent inductive

<sup>3</sup> DSL stands for 'Digital Subscriber Line'

<sup>4</sup> <http://www.internetworldstats.com/stats3.htm> (Accessed on Feb 11th, 2011)

<sup>5</sup> [www.pta.gov.pk](http://www.pta.gov.pk) (accessed on June, 2011)

<sup>6</sup> HFC, WiMAX, FTTH and EvDO Stand for fiber based and wireless broadband technologies namely: 'Hybrid Fiber Coaxial'; 'Worldwide Interoperability for Microwave Access'; 'Fiber to the Home'; and 'Evolution-Data Optimized or Evolution-Data Only' respectively.



generalizations based on this empirical work. In result of the recently taken telecom reform initiatives for the sector deregulation and liberalization, the Pakistan's telecom market is reportedly becoming more vibrant and open for the competition and foreign investments; but there are still observed many hurdles on its way to becoming fully flourished and blossomed, and that has been called hampering the sustainable growth of the telecom sector. All these debatable issues have been profoundly discussed throughout the case study.

Finally, here a short introduction of the main actors of policy & regulatory domain and of the supplier domain seems to be useful and relevant. The 'policy domain' consists of the 'Ministry of Information Technology' (MoIT), which takes care of IT (Information Technology) and Telecom related policy matters, as it has two different divisions to take care of each policy subject. Recently, MoIT has been renamed to MoITT (Ministry of IT & Telecommunications); however this thesis would consistently use the previous abbreviation with a single 'T' (i.e. MoIT) whenever referring to the ministry, both for the sake of simplicity and also because still the previous abbreviation has been mostly used in the media and research reports while referring to the ministry. The 'regulatory domain' consists of the sector-specific telecom regulator named as 'Pakistan Telecommunications Authority' (PTA), the frequency allocator or regulator called 'Frequency Allocation Board' (FAB), and the sector-wide competition regulator known as 'Competition Commission of Pakistan' (CCP). MoIT and all other regulators are part of the 'Cabinet Division' which acts as Government's policy and administrative arm to ensure the effective implementation of the prudent policies.

The analysis of 'supplier domain' has been mainly focused on the role of telecom operators and service providers in the diffusion of telecom services, considering the fact that Pakistan is essentially a services' market, with relevantly only a marginal role has been acknowledged for the local manufacturers and telecom production industry, in terms of controlling and shaping of the domestic telecom market. The fixed incumbent (which has been recently privatized) is named 'Pakistan Telecommunications Corporation Limited' (PTCL), whose dominant role due to its stringent control over the telecom's 'essential facilities' in the country has been seen quite critically by the other telecom suppliers including the ISPs, fixed line, mobile/cellular and broadband operators. There are currently 5 country-wide cellular operators competing head-to-head for grabbing the cellular market shares, but all of them are based on GSM (Global System for Mobile communications) network. There are also multiple broadband operators contending in an increasingly competitive market, using different technological platforms; hence, resulting not only in an inter-operator competition but also more interestingly in an inter-technology competition as well. The fixed line market especially the landline is however, essentially considered to be a fully dominant (monopoly) market despite the presence of many licensees; whereas the fixed-wireless or WLL (Wireless Local Loop) market shows a moderate growth and a rising competition between several operators on the regional basis (within the 14 so far declared telecom regions of Pakistan). In the strategic terms, the different segments of telecom sector are passing through different stages

of development (i.e. currently locating at different ‘quadrants’ of BCG Growth-Share Matrix<sup>7</sup>) as per the growth trend and the relative diffusion of the comparative telecom services.

The case study (chapter 4-10) incorporates in detail a wide range of issues relevant to the diffusion of telecom services in light of the discussions made by the respondents. Please refer to the tables 4 and 5 for a general introduction of the range of actors within different domains, and the list of actors and institutions engaged in this research, appendix 5 (for the history of telecom development in Pakistan), and the market competition analysis (section 7.3 – the HHI<sup>8</sup> analysis) for further understanding the competitive nature and formation of the telecom market.

### 1.5.2 Some Facts and Figures about Pakistan

Pakistan is the 6<sup>th</sup> largest populated country in the world with around 185 million habitants and a ‘median age’ of just 21 years (compare e.g. with Sweden with the median age of 42 years), hence indicating a very high ratio of youth population. The national language ‘Urdu’ is widely used as a medium for primary and higher school education, and it is also the commonly spoken (or understood) language used for the communication purposes among the people living across the country; in addition to a variety of other local languages. However, due to being a former British colony while being part of the Indian subcontinent; English has been given not only the status of an official language in Pakistan, but it has been also used as the primary medium of education in the colleges and universities. The country has currently 50% literacy rate (as measured based on the benchmark of primary schooling with a limited ability of reading a text within their local languages), and a 36% urbanization ratio (2010 est.). With a geographical area of 796,095 sq km (i.e. 3.27 times larger than the size of the United Kingdom), it is the 36<sup>th</sup> largest country in the world. It is a ‘rich’ country in terms of its total ‘Gross Domestic Product’ (GDP) which essentially exceeds \$433 billion, ranked as 28<sup>th</sup> (among the top) within the list of countries; however it is extremely ‘poor’ country when speaking in terms of GDP (PPP)/‘Capita’<sup>9</sup> with only \$2400 (2009 est.), and hence ranked as 178<sup>th</sup> (at the bottom) among the world’s nations<sup>10</sup>.

This South Asian country is located strategically in a very sensitive and significant position surrounded by India in the East, China in the North, Iran and Afghanistan in the West and finally Arabian Sea in the South. It borders 6,774 km with the neighboring countries, whereas its coastal line extends up to 1,046 km along with the Arabian Sea. Due to the regional sensitivity, Pakistan has been remained under a continuous political pressure as being the center of interest for many regional and global



<sup>7</sup> The Boston Consulting Group’s (BCG) Growth-Share Matrix has been briefly illustrated here:

[http://www.mindtools.com/pages/article/newTED\\_97.htm](http://www.mindtools.com/pages/article/newTED_97.htm) (Accessed on Dec 14<sup>th</sup>, 2010)

<sup>8</sup> HHI stands for Herfindahl-Hirschman Index – an index which has been frequently used for the competition analysis

<sup>9</sup> GDP (PPP) stands for Gross Domestic Product (Purchasing Power Parity)

<sup>10</sup> <https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html> (Accessed on Dec 19<sup>th</sup>, 2010)

economic & political powers. Due to the continuous foreign interventions and having suffered from an unending internal political instability, the country currently faces a highly fragile economy with great economic uncertainty. The country has been officially declared as a democratic state; however, the people of Pakistan haven't yet seen the fruits of democracy in terms of economic prosperity, social justice and societal welfare due to the prevailing unfair economic distribution and imbalanced political power structure over the decades, ever since its appearance on the world's map back in August, 1947.

## **1.6 Some Reflections on 'Diffusion Analysis' and 'Research Questions'**

In the author's perspective, the 'diffusion analysis' in case of telecom services should include the following major elements:

- Industrial mapping in order to identify the whole range of involved (or associated) actors, their specific positions in the map, and the assigned roles in a given framework;
- Identifying all those potential forces, factors and reasons that may influence the pace of the adoption and diffusion of telecom services in a specific socio-economic context;
- Making a comparative analysis of the relative diffusion of different telecom services within a similar socio-economic context in order to identify those service-specific attributes that potentially make the difference;
- Making a comparative analysis of the relative diffusion of similar telecom services within presumably different socioeconomic contexts in order to identify those context-specific attributes that potentially make the difference;
- Identifying the observed social, political and economic impacts of the diffused telecom services in terms of the potential change in the adopter's level of competence, efficiency and empowerment in the competitive scenario;
- Understanding actually how the competing 'translations' led by the different 'focal' (leading) actors strive to promote their own versions of 'truth'; in order to protect their specific political and economic interests associated with the particular patterns of the diffusion of telecom services in the focused context of adoption;
- Making policy, regulatory and strategic recommendations in order to help designing an effective and optimal policy & regulatory framework, and a strategic roadmap capable of addressing the challenges identified in the above analysis.

In light of the above proposed definition of the 'diffusion analysis', and in order to study the relative diffusion of comparative telecom services within a complex socio-economic context; the author aims at investigating the following four major research questions. Hence, the whole discussion of this thesis would be revolving around inquiring the following research questions.

- Who are the major actors within the policy, regulatory, supplier, supporting and user domains, considered as essentially composing the telecom services' market in Pakistan; and how the interactive patterns of their mutual communications and interrelationships within

and across the different domains can be mapped out for an improved understanding of the market dynamics?

- What impacts the diffusion of telecom services has brought for the Pakistani society and particularly for the telecom consumers, while looking from different aspects of the life?
- What are the major attributes that play a critical role in the successful diffusion of telecom services; or the other way round, what are the major bottlenecks that impede the development of telecom sector and the diffusion of telecom services in a complex socio-economic context, like in the case of Pakistan? Why the relative success as experienced in case of the rapid diffusion of mobile services couldn't be replicated in case of the diffusion of fixed telephony and internet services in Pakistan?
- What policy measures, regulatory practices and supplier strategies can be adopted that might help facilitating the rapid and productive diffusion of telecom services in Pakistan, or in case of other countries sharing similar societal attributes or facing similar challenges?

## **1.7 Research Aims and Expected Beneficiaries**

This research aims at creating a detailed research and academic account on the diffusion of telecom services in a complex socio-economic context, while taking Pakistan as a case study. The research aims at delivering factual explanations on yet many unanswered research questions and the diffusion dilemmas, especially in case of the diffusion of complex technological solutions e.g. the telecom services; in order to make an acceptable academic contribution to this ongoing discourse.

It is expected that the explanations made by this research would be useful for a wide range of audience groups including the policy makers, regulators, telecom suppliers (operators, vendors, service providers), researchers, academics, telecom users and the society in general who are supposed to be interested in understanding the dynamics and applications of the diffusion of telecom services within a complex socio-economic environment. However, a basic knowledge about the telecom services is considered to be additionally helpful in understanding the forthcoming debates, and also the list of acronyms and technical terms used in this thesis.

### ***Policy for the Use of 'Acronyms & Abbreviations' in this Thesis***

As a matter of fact, writing a thesis on a subject relevant to the management of telecom services essentially requires an effective use and understanding of a very large list of the acronyms, as it is considered to be a basic tenet of an interdisciplinary study such as the 'technology management'. Hence, the author cannot escape from undertaking this challenge; however it has been attempted hard to define a clear policy for the presentation and an effective use of these lists of acronyms in order to facilitate both the familiar and relatively unfamiliar readers of this subject. For the readers' convenience, whenever a new acronym or abbreviation would be introduced in the following text for the first time, it would be immediately explained within the brackets either in front of the acronym or in the footnote. However, in case of the repetitive use of the already explained terms in the following text, only their acronyms and abbreviations would be mentioned for the sake of brevity. In addition to that the whole range of the used acronyms and abbreviations has been listed out in end of the thesis, to help readers as a quick reference guide.

## 1.8 Report Structure

The following illustrated report structure (fig. 2) presents the nomenclature of this thesis, and refers to the logical development how this research has been formally structured. Since, the discussed topics are strongly linked and connected with each other; hence maintaining the sequential flow, while reading the thesis, has been recommended in order to fully grasp the logical relation of the current debates with the past and the forthcoming discussions.

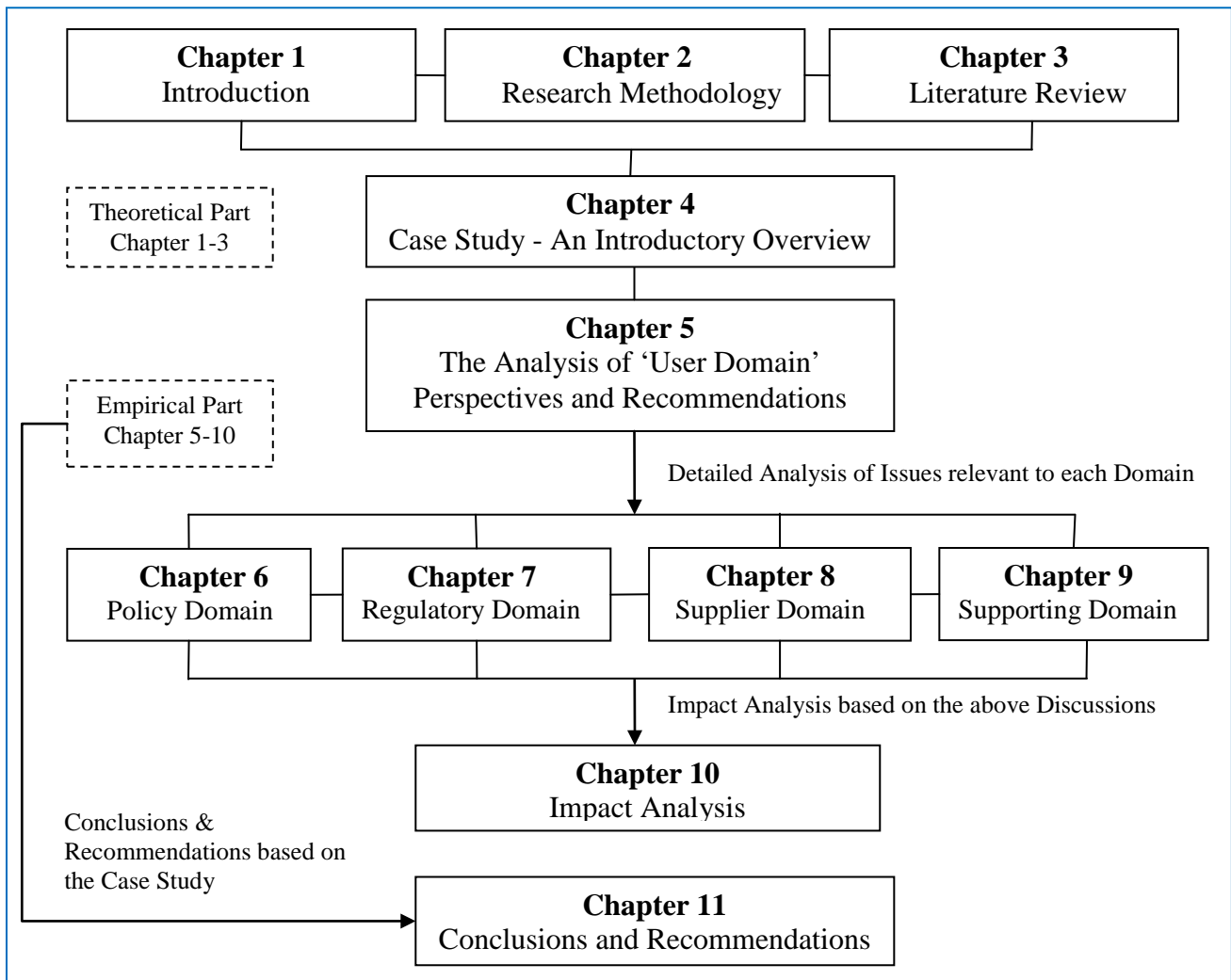


Fig. 2: Report Structure – The Logical Flowchart

## Chapter 2

### Research Methodology

Dealing with the inherent complexities of the focused case study; many theoretical frameworks and research methods have been used as sources of inspiration and guidelines at different occasions of this thesis, but none of the research framework or any specific paradigm has been strictly followed for an obvious reason. And that reason is the fact that the author didn't find any of these paradigms fully capable of handling the depth and breadth of the scale of complexities involved in this research. Hence, the author has attempted to avoid narrowly following any specific research framework from head to tail, and instead tried to create the synergetic effect out of the careful application of most suitable frameworks and approaches at different stages accordingly, somewhat in a 'cherry picking' fashion. This experience has been deemed helpful in cross-checking the strength and weaknesses of different approaches at different moments; in order to provide an authentic account as per the reliability and validity of the research and the subsequent results respectively. In the following section, the different research frameworks or methods used during this research have been elaborated precisely in context of their applications.

#### 2.1 The Contextual Applications of Different Research Methods

This research is primarily inspired by the methodological approaches of 'Mixed Methodology' ('Triangulation') and the 'Grounded theory' for both data collection and its subsequent analysis; however the research also extensively makes use of the other approaches such as 'Action Research', 'Actor-Network Theory' (ANT), 'Hermeneutics' and 'Case study' methods at different parts of the research. In the following paragraphs, the above referred research methods have been further explained as per their usage during this research.

##### 2.1.1 Mixed Methodology (Triangulation)

Greene, et al. (2001, p.25) explains that "the social phenomena that we study on the ground in the real world are unarguably complex, dynamic and contextually diverse and it challenges us to understand the human behavior in all of its natural complexity and individuality. Our work is conducted in natural settings, where history and context matter, where human behavior traces complex patterns of influences and relationships, where what is meaningful to those in the setting is arising from both lived experiences and the societal institutions that frame and shape those experiences". She highlights the need to understand those complexities in order to make sense of the contemporary social problems and to effectively address them with promising solutions. It has been insisted that there is a need to make an effective use of different methodological expertise and skills in this endeavor for comprehensively understanding the technical developments within those complex socio-economic environments. Thus she further comments (2001, p.26) that "we need to marshal all of our multiple ways of theoretical insights, and the associated research techniques, in an attempt to improve our understanding of those complexities". Greene et al. (2001, p.27) explains that there is an increasing acknowledgment within the research community about the potential benefits of "mixing different research methods and techniques in a useful way to collect a variety of data; for example employing interviews to understand the nuances of the respondents' experiences

of a program, and questionnaires to obtain quantitative information, since different kinds of methods have different suitability for learning about varying phenomena”. However, she further comments that this approach necessarily demands a heightened reflexivity and responsiveness, which rests on openness to diversity, acceptance and respect for differences, higher tolerance to uncertainty and increased scale of adaptability.

As per Olsen (2004) the term triangulation is defined in social science as the mixing of data or methods so that diverse view points or standpoints cast light upon a topic. She further argues that the recent developments in the philosophy of science have argued that the two dominating research approaches namely qualitative and quantitative methods should not have separate boundaries or operational spheres, but rather they should overlap and interact with each other in an equal status. She explains that the pluralism in methodology or the ‘triangulation’ is not aimed merely at validation but at deepening and widening our understanding of a complex field, particularly in an ‘interdisciplinary research’. The mixing of methodologies, e.g. mixing the use of survey data with interviews, has been called a more profound form of triangulation. Olsen (2004) refers to Lenin’s work (1898) on the ‘Development of Capitalism in Russia’ as one of the pioneering work which essentially used mixed methodology (triangulation approach) for treating simultaneously the discourse analysis (qualitative methodology) and survey data (quantitative methodology) for his research on investigating the beginning of working class conflict with their employers in Russia.

The purposeful mixing of research methods is aimed at bringing the following benefits, as explained by Greene et al. (2001, p.30).

- Enhanced validity and credibility of inferences: Mixed-method triangulation design should ideally help in offsetting methodological biases in conducting research
- Greater comprehensiveness of findings: More complete accounts of social phenomena and more comprehensive picture of how policies impact on the social world since different methods are used to offer different stands and perspectives in defining the ‘reality’
- More Insightful understandings: The pluralism of research methods may yield findings that do not converge, but rather challenge or even conflict with one another; and thus must be reconciled through further analytic questioning and probing, which may lead to the discovery of new concepts
- Increased value consciousness and diversity: Multiplism promises to make policy research more intellectual, value conscious, and debate-centered. Diverse perspectives of multiple stakeholder and their different values and interests accordingly invite critical commentary, public debate, and deliberative dialogue

Since this thesis aims at understanding the diffusion of telecom services in a complex socio-economic context, hence employing a mixed-methodology approach suits well in order to comprehensively cover the involved complexity within the case. Hence, the author has used in this research both the quantitative and qualitative methods for data collection and subsequent analysis to strengthen the research reliability through cross examining the inferences drawn from the conducted



interviews, observations and discourse analysis on the one hand; whereas the statistical and graphical results produced from the filled questionnaires on the other hand.

### **2.1.2 Grounded Theory**

The intellectual assumption of the interpretive and grounded theory approach is that the 'reality is not an objective thing' out there separated from the observer's interference and interpretation, but it emphasizes on the existence of multiple realities which are socially constructed and interpreted by the observers and researchers. Goulding (2002, p.40) explains that the researchers and phenomena are mutually interactive and the output of the research is socially constructed (particularly in the social sciences). Hence, the label 'grounded theory' refers that "the source of the developed theory is ultimately grounded in the behavior, words and actions of those under study". She further explains that the primary methodological operation in this approach is to go from concrete to the abstract. The primary technique is to overcome prejudices and biases through the use of coding. Abstraction (from coding the data) is a qualitative measure/operation to build a theory which has a universal or nomothetic application. Abstraction makes the creativity and dynamism in the research otherwise it will move around the same established concepts and old theories. The theory has features of both 'systems' and 'actors' approaches. It considers that a person's self identity grows out of his/her relationship with others (social reality). Also it asks the researcher to enter the worlds of those under study in order to observe the actor's environment and the interactions and interpretations that occur. Unlike many other methods, it does not wait until all the data is collected before analysis begins; rather, the search for meaning through the interrogation of data commences in the early stages of data collection.

Goulding (2002) highlights the fact that in this case the central objective is theory building, rather than theory testing i.e. it is essentially an inductive approach. It provides the most comprehensive, coherent and simplest model for linking the diverse and seemingly unrelated facts in a useful and pragmatic way. It's a way of revealing the obvious, the implicit, the unrecognized and the unknown. She makes further explanation that theorizing is the process of constructing alternative explanations until a 'best fit' is obtained that explains the data most simply. This involves asking questions of the data that will create links to established theory. One of the key aspects of grounded theory is the generation of good ideas. It emphasizes on new discoveries i.e. to generate theories in the areas where little is already known or to provide fresh slant on existing knowledge. It is an interpretive mode of enquiry so the discourses, gestures, expressions and actions are all considered primary to the experience. However, she warns that it is essentially a time-consuming research method because of its interactive nature that demands for continuous interaction from the start to the end with the field research and the simultaneous analysis and updating of the results until a satisfactory level of saturation has been achieved. It frequently takes the research in a number of different directions before a plausible theory starts to emerge. Hence it requires patience, an open mind and flexibility. She suggests that Grounded theory will not appeal to those researchers who are in search of absolute certainties, neatly defined categories and objectively measured explanations. It rather appeals to those whose view of behavior allows for process, change and ambiguities, and to those who hold a desire to explore meanings and experiences, and are willing to engage sometimes in an



eclectic manner with the complementary theories, which often fall outside of the immediate field of study. (Goulding, 2002)

The field study and the data collection process for the current research was primarily comprised of five major sources of information, which were both sequentially and simultaneously applied as per the requirements of the specific contexts and situation within which the data had to be collected. It was attempted to retrieve maximum useful data from the field using different research methods in order to cross-check the authenticity of the acquired data throughout the process i.e. right from the beginning till end of the research. It was also attempted to staying in the field even after the field study had been formally completed (e.g. through virtual presence using different electronic means of communications) until the data appeared to be saturating and the same patterns were seemed to be repeating in the new collected samples of the interviews and dialogues. It was noticed that in following the new narratives, no further surprising elements were found, and rather the same stories were being repeated; hence, indicating the occurrence of the saturation level.

The five major sources of information used for the data collection in this research were:

1. Archive analysis including the research papers, news reports and internal documents
2. Observations
3. Well-structured Surveys (Questionnaires) conducted through 'Workshops'
4. Semi-structured interviews
5. Informal dialogues and open discussions

The field study was conducted through frequently interacting with a wide range of texts, and a selected sample of persons and institutions in order to cover the diverse perspectives of relevant stakeholders on different issues. The multiplicity of issues and the variables discussed in this research seems highly relevant and helpful in developing a comprehensive understanding of the core issues (the research questions), while exploring the facts both in terms of their scope (extent) and the depth (complexity). Focusing on only one or a couple of aspects in isolation of the other connected links would have risked missing many important dimensions that could only be explored if they were seen as mutually well interconnected and intertwined with each other, which actually they are in practice. Hence keeping in mind this fact, a 'dialogue map' (relevant topics of discussion) was defined for each domain in order to facilitate the discussants in reflecting on the highlighted issues; in addition to anything else they considered significant, but not mentioned in the list of raised issues. Hence the list of given topics only served as a guide or a point of departure for the followed up discussions (particularly in case of the interviews and dialogues), which were conducted in more like a semi-structured and relatively informal pattern in order to retain a certain degree of flexibility for the discussants, as given the mandate to include or exclude any topic from the discussions as per their choice, consideration and competence.

Alvesson and Sköldberg (2009) have made a detailed account on the origin of grounded theory, mentioning that "the theory has dual roots, one in symbolic interactionism in the person of Strauss, and other in the statistically oriented positivism of Glaser's intellectual luggage". It has been stated

that with the passage of time the theory has suffered from the fragmentation and dilution of the original ideas, as can be observed even from the debates between the two founders of the theory (i.e. Strauss and Glaser). The central features of the theory have been mentioned: pragmatism (i.e. the social utility and social control as an outcome of research); ideographic research (based on the data of a particular case and not inspired by nomothetic study of mass data); qualitative exploration of the reality from the grounded data (flexible methods for data collection with revisions as per requirement); sensitizing concepts (stimulating for perceiving new relations, perspectives and world-views); social action (symbolic interactionism and intersubjectivity); cognitive symbols (continual recreation of 'self' and 'meanings'); and successive induction from empirical material. According to the Glaser and Strauss (1967) perspective, the main emphasis has been given here on the 'discovery' rather than the 'verification' of theory. The objective of research has been told the generation of theory, while verification is there only to serve the generation process. The grounded theory allows anyone to create theory as long as they start from 'reality' i.e. the grounded data in the field. Hence they refrain from talking about verification or testing and rather aim at 'applying' the theory within the specific context of a focused case in order to realize under what circumstances a developed theory works; so it is not a matter of 'falsification' but a matter of 'modification' and 'application' to build new theories for each studied case. Since grounded theory is derived from field data; hence it is developed inductively, and it opposes the 'logical deductive' view which seeks instead to start from theories. (Glaser and Strauss, 1967)

The Glaserian research paradigm of Grounded theory (GT) claims the dictum 'all is data' (Dick, 2005). This means that not only interviews and observational data but also surveys/questionnaires and statistical analyses, or in short whatever comes the researcher's way while studying a focused area of research including the literature data from science, media or even fiction; can all be used in the comparative analytical process. Thus the method according to Glaser is not limited to the realm of either qualitative or quantitative research. It has been further insisted that GT is a systematic generation of theory from data that contains both inductive and deductive thinking. The goal of GT is to discover the participants' main concerns, and how they continually try to resolve it. The questions the researchers keep on asking in GT are 'What's going on?' and 'What is the main problem of the participants and how are they trying to solve it?' It has the goal of generating concepts that explain people's actions, and here descriptions are used to illustrate those concepts.

Goulding (2002) explains the theory development process in multiple steps using the Grounded theory approach. The first step deals with the collection and interpretation of the data and is primarily concerned with demonstrating how, why and from where the early concepts and categories were derived. It's important since the theory should be traceable back to the data. The second step is to abstract the concepts and look for the theoretical meaning. The third step should present the theory, uniting the concepts and integrating them into categories which have explanatory power within the specific context of the research. The author sketches the above mentioned three steps in figure 3 in order to highlight the framework that has been largely used during this research for the data collection and its subsequent analysis. At first stage the data received from the recorded interviews and the 'qualitative part' of the questionnaires (recommendations, complaints,

reflections, arguments etc.) was scripted in huge volumes of translated texts. However, it has been tried at best to not distort or derail the actual meanings of the text at any occasion during the interpretation or translations of those bulky volumes of firsthand data. At this stage the author's role and mandate was not more than helping out the respondents in articulating their spoken words and written texts in plain, precise and understandable drafts. On the other hand, the quantitative data from the survey (questionnaires) were treated in a traditional way by following a 'pattern finding' approach through statistical and graphical analysis, which resulted in quite a few interesting graphs. The explanatory power was given by the author in translating those graphs accordingly. The data analysis of the questionnaire was preferentially completed in order to first get the users' account on this debate, since their responses were found more holistic and diverse in terms of scope.

### Three Steps of Theory Development

#### Horizontal Structure of Concepts

Concentrated level of abstraction

#### Vertical Structure (sub-concepts or properties)

Different levels of abstraction

Descriptive Concepts in Categories

Raise new questions to recycle the process

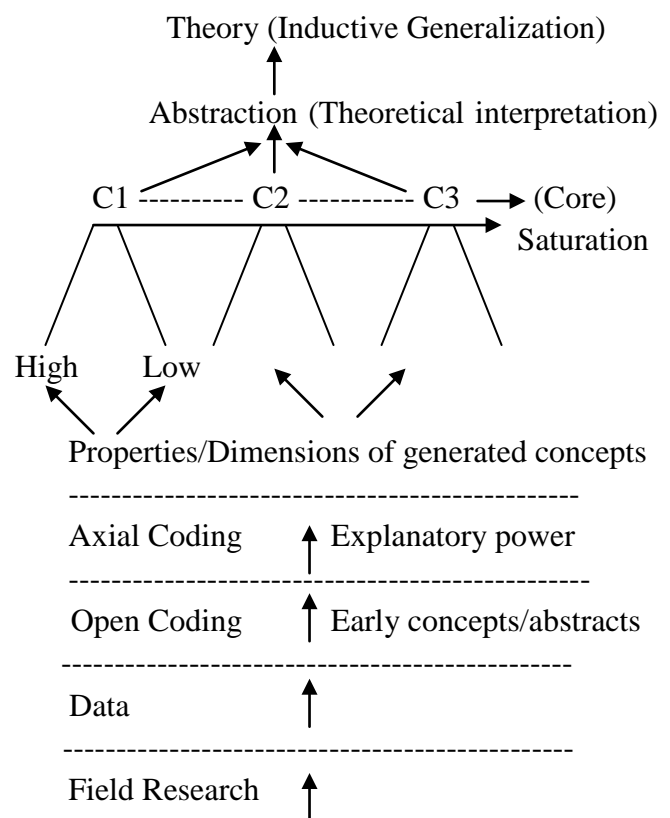


Fig. 3: Grounded Theory as Followed by this Research

Source: Author, inspired by Goulding (2002, Ch. 4)

The second stage was composed of developing some 'early concepts' out of the collected data from the interviews, qualitative part of questionnaires and observations through making some broad categorization of the collected data, which may have been considered similar to the concept of 'open coding' in terms of GT. After this initial pattern finding exercise during the qualitative analysis, the initially emerged early concepts were subsequently linked with each other in order to develop more sense and meaning out of the early categorizations. This iterative cycle of coding

practice through mixing and matching data within different groups of categories were resulted in the emergence of more refined ‘core categories’ which appeared to have a better or stronger ‘explanatory power’ (i.e. axial coding). However, at no stage the forceful induction of data was allowed within predefined categories, and it has been tried at level best to let the data define their associated categories themselves more like in a ‘self-emergent’ fashion.

In the third stage, the different dimensions of descriptive concepts were given a theoretical meaning by debating those concepts in relation with the other discourses in the literature, and through cross-examining the differing (or often conflicting) explanations on a range of issues. In order to do that, the author assumed itself an independent and unbiased participant in this ‘reality-finding’ mission by being an active part of the ongoing heated debates taking place among the relevant stakeholders; as they were raising their voices with varying interests based on different underlying assumptions about the construction or the reality within their social worlds, as it has been described in figure 4.

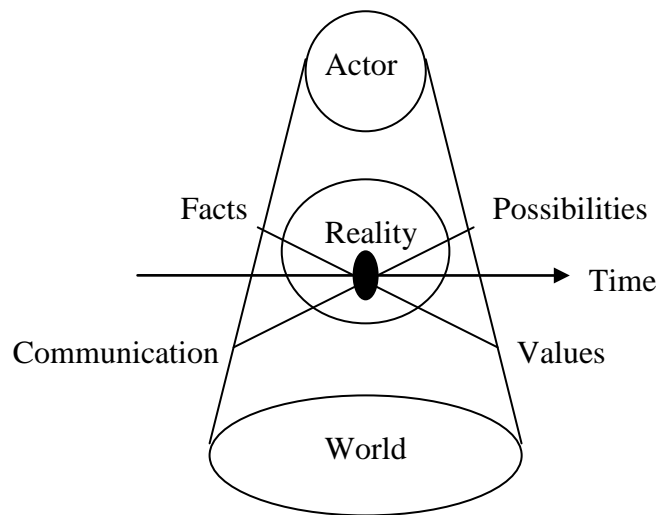


Fig. 4: Reality as a structure of relations between the actors and the worlds  
Source: Arbnor & Bjerke (1997)

The above figure explains the phenomenon of the social construction of the reality in the surrounded world where for digging out the ‘reality’, it is not enough to merely depend on finding the ‘facts’ (i.e. using the observational schemes or only counting on the statistical numbers for the past and present moments); but searching for the ‘possibilities’ (i.e. elements of reflection for the future) is also imperative. Hence, here including the temporal, spatial and contextual elements into the debate becomes necessary. However; for that, one also needs to correctly understand the underlying ‘values’ in order to effectively select one out of the many ‘possibilities’. Finally, a channel of ‘communication’ (a common language) is also required in order to effectively deliver the message or to clearly specify the understood or assumed values to others.

### 2.1.3 'Actors Approach' and 'Actor-Network Theory' (ANT)

As opposed to the 'analytical' and 'systems' approaches, the 'actors' approach considers the 'reality' as being socially constructed in result of a continuous dialogue and interaction between different actors; and hence the collective meaning structure takes place through interpretations. Arbnor & Bjerke (1997) explain that the actors approach is interested in 'understanding' the reality instead of explaining the reality. The reality i.e. the 'whole' is understood by the 'finite provinces of meanings' (Berger and Luckman, 1966) held by the individual actors in the particular social context. The finite province of meaning is not the 'picture' of reality i.e. the image of the external world, but is the reality itself. 'Reality' is taken as a social construction that is intentionally created by social communication processes at different levels of meaning structures, and the used language is given different meanings with respect to the contextual requirements at each stage. The actors approach aims at reproducing the meanings that various actors associate with their acts and the surrounding context. The relations between the wholes and their parts and within the parts are ambiguous, evolving, reshaping and continuously reinterpreted. To understand actors involves understanding their 'pre-understanding' (Arbnor & Bjerke, 1997).

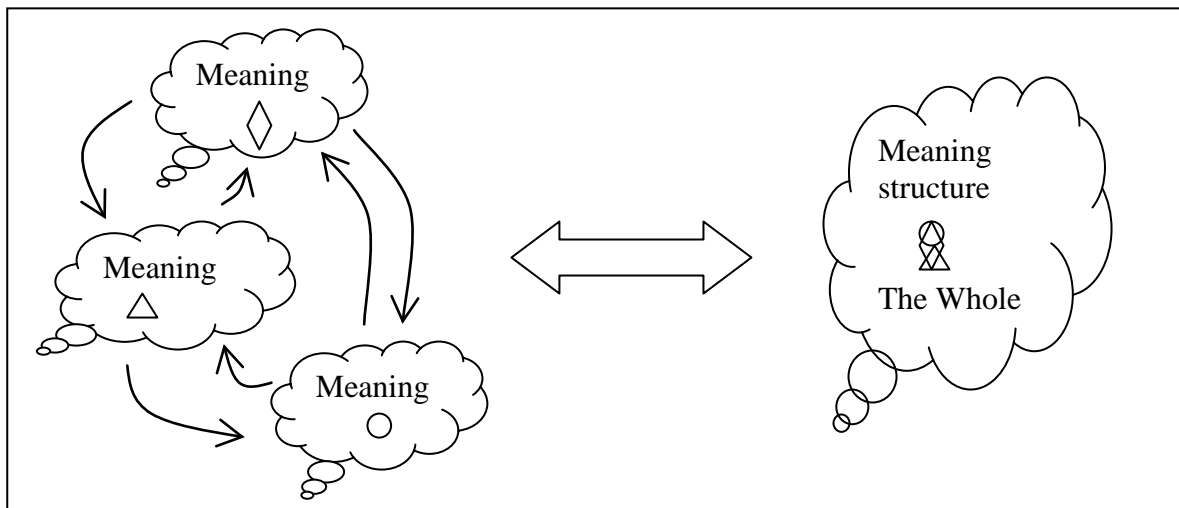


Fig. 5: The Actors Approach: 'Reality is socially constructed as a result of continuous dialogue and interaction between different actors and the collective meaning structure takes place through interpretations'

Source: Arbnor & Bjerke (1997)

It is thus an 'emergent process' which takes shape as understanding gradually increases with the time and increased interactions, following an iterative cycle of continual learning to gradually develop a better or improved understanding over the time. This is achieved by exploring not only the incidents themselves (through statistical reporting and storytelling), but more importantly also by thoroughly investigating the respective roles and the nature of relations between the range of engaged actors through understanding their ongoing translation schemes and the stated positions for those events and occasions they were/are engaged in. An effective use of the 'dialogue' scheme to effectively engage the range of involved or interested actors within these insightful discussions lies at the heart of the actors approach.

Actor-Network Theory (ANT) is a theoretical framework within the actor's approach which originates from the work of Callon (1986) and Latour (1987). ANT perceives the world as consisting of actor-networks i.e. the individual actors or elements connected and linked with each other making heterogeneous networks consisting both human and non-human elements. The induction of non-human actors (such as the texts, policies, regulations, technological artifacts etc.) into the debate has been viewed as the key feature among the other important contribution of this research school. Hence, ANT counts on both the material and semiotic relations between the human and non-human actors. The 'punctualization and depunctualization' concepts as defined by ANT help in opening up and exploring the internal makeup of a 'technological black box' in order to understand the formation and relations between its components. The theory highlights how different competing or counter networks compete with each other using four different stages of translation to construct their own 'worlds' and 'meanings' for the others to follow suit accordingly; and secondly how within these actor-networks the powerful and leading elements translate themselves as indispensable, and hence become capable of controlling the translation process as 'focal actors'. To do so, the focal actors need to effectively engage with the other 'mediators' and supporting actors in order to successfully complete the interest alignment and enrollment stages of the translation process to realize the fulfillment of their particular interests.

The theory introduces different interesting and insightful concepts such as the four stages or moments of translation process namely: Problematization, Intersement, Enrollment, and Mobilization. In the 'problematization' stage, the leading actor defines the problem (or highlights yet an unidentified problem) from its own lenses while inscribing the desired meanings to the words in order to use the given meanings in its favor or interest, as perceived in the future context. In the 'intersement' stage, the leading actor reinterprets or appropriates the interests of other human and non-human actors as per its own interest by formulating different strategies in order to convince or align their interests with its own interest. In the third stage of translation i.e. the 'enrollment' stage, those who agree with the definitions and meanings or the roles 'inscribed' by the leading actor for them are eventually enrolled into the envisioned network, whereas the rest who couldn't be convinced are subsequently discarded from the network; and hence the relative impact of the discarded elements of potentially influencing the others is also gradually diluted using different strategic means. In the fourth and final stage of translation i.e. during the 'mobilization', the enrolled human & non-human actors are then effectively mobilized & their activities are coordinated to achieve the targeted results. The subject has been discussed again in the next chapter.

The current thesis gets partial inspiration from the Actors approach and the analytical framework of ANT both for the data collection and its subsequent analysis. Hence, led by this inspiration the author remains keen to finding the associated networks and the interest-driven translations made by those competing networks. Exploring the competing accounts or varying translations about the past and currently unfolding events were found extremely useful and relevant in revealing the embedded actor-networks that were actually shaping those translations. Hence, the inspiration from the ANT's recommendation to 'follow the actors where ever it takes the researcher' i.e. following the thread as

pointed out by the earlier interviewees and respondents, was found very helpful in mapping the telecom industry. Hence, it helped in finding the key individuals (spokespersons) of those competing networks in order to get their ‘versions of truth’ or the ‘competing accounts’.

#### **2.1.4 Case Study**

Yin (2003) makes a detailed account on ‘case study’. The case being studied during this research resembles to the ‘case study’ research method in following aspects:

- Studying a contemporary phenomenon in its real life context
- Blurring boundaries between the phenomenon and context
- Relying on multiple sources of evidence (triangulation)
- Setting a criteria for interpreting the findings, especially for the statistical and graphical analysis

However, the current research doesn’t fit under the ‘Case Study’ method due to the following dissimilarities:

- The current research definitely benefits, but doesn’t depend on any prior developed theories to an extent of narrowly following those theories (deductively) for the purpose of theory testifying or falsification. Hence, in that sense this research is more like a hermeneutic and inductive in its nature, aiming at self-designing the research framework and it reiterates the learning cycle to find out what fits well within any specific context during the study at different occasions. The study allows learning from any existing stock of theories and also welcomes having a pre-understanding about the particular case or any system under the study; but neither it follows any preconceived rigorous propositions and hypothesis based on the current theories, nor it assigns the task to itself to testify the validity of the those assumed propositions or hypothesis (i.e. ‘falsification’) through taking support of the empirical evidences in a strict sense.
- Despite having many idiosyncrasies of the specific case under the study, still the scope of application and utilization of the concluded results can be expanded to other cases as well that essentially have a similar background in terms of offering a complex socio-economic context for the diffusion of telecom services. Hence, the results can be generalized for the other cases if the contexts of applications are carefully analyzed and properly evaluated.

#### **2.1.5 Action Research**

Action research is a flexible spiral process which allows action (change, improvement) and research (understanding, knowledge) to be achieved at the same time. The understanding allows more informed change but the resulting change brings further useful information subsequently for the changing agents; hence creating a reinforcing cycle. People affected by the change are usually involved in the action research. This allows the understanding to be widely shared and the change to be pursued with commitment (Ferrance, 2000). The existing research was composed of iterative cycles of learning and the subsequent adjustments (spiral process) in result of the inferences made during the taken ‘actions’ and the ‘critical reflections’; and hence the understanding has been gradually improved during each cycle. In result, the later cycles helped in continuously refining the methods used for the data collection and the following analysis or interpretations. From this perspective, the research took inspiration from the ‘Action Research’, however the scope of ‘action’ to bring ‘change’ during the process was limited due to the fact that the available timeframe for the

conducted field study (4 months) was considered too short to aim at bringing any major change in such a large ‘unit of analysis’, essentially representing a highly complex socio-economic context. However, as a trial case the author did try to test the acceptability of a proposal by sending it to different banks (see appendix 2), computer dealers and university administrators, in order to check their conformity with the proposal. The proposal was aimed at increasing the affordability among the university students to help them own a personal laptop for their studies by taking support of a micro-financing scheme. That initiative though did not prove to be fruitful; however the experience itself was quite helpful in understanding the real complexities involved on the ground level. Hence, this part of action based research could have been considered well in line with the approach of ‘action-research’. No doubt and needless to say that the whole spirit behind the current research is to propose an ‘action plan’ or an inspirational framework, through which the desired ‘change’ could have been brought into this complex arena of the Pakistan’s telecom industry for its sustainable growth. Whereas the second part of the ‘Action Research’ i.e. the ‘research’ itself in this particular case was fully aimed at developing a new ‘understanding’ out of this interactive learning process.

### 2.1.6 Hermeneutics

This approach assumes that all understanding is based on a pre-understanding and always one has the pre-understanding but they need to be testified (Arbnor & Bjerke, 1997). The hermeneutic process of understanding intends to improve the pre-understanding. It uses the hermeneutic circles (as mentioned in the figure) to gradually develop a better understanding through revising the previous pre-understanding in the process of continuous dialogue and interpretations.



Fig. 6: The hermeneutic process of improving understanding

Source: Inspired from Arbnor & Bjerke (1997)

Many social scientists think that the research methods of the natural sciences are not suitable to be applied in the social science domain and they find decisive differences e.g. between explaining a ‘natural phenomenon’ and a ‘cultural or behavioral issue’; both in terms of understanding and interpretation. It has been argued that the ‘Positivist approach’ could have been considered fully valid in the presence of a completely rational world with objectively rational actors (assuming no ‘information asymmetries’) for having an opportunity to make a totally rational decision; however, such a world doesn’t exist in reality (Arbnor & Bjerke, 1997). It has been further discussed that understanding never appears as an objective knowledge to be quantified in statistical terms, since every case in the socio-cultural world is unique and cannot be governed by an objective rule with universal applicability. ‘Positivists’ however, think that the social world is so complex that it needs to be simplified and reduced to measurable and quantifiable parameters; whereas the ‘hermeneuticists’ argue that the social world has been already so much simplified by the researchers’ extensive use of schemes, models, scales, labels, and different concepts, that



hermeneutics as a science now needs to rather devote itself studying the problematic issues within its full complexity and the surrounded framework in order to sufficiently encapsulate and address the whole range of connected issues. This research is inspired by the theme of allowing the pre-understanding to remain on the background; but without letting it to dominate or influence too much over the exploratory and explanatory parts of the research process i.e. beyond the certain limit of delivering the essential guidance about dealing with an unfamiliar and complex socio-economic world. In this context, the author doesn't agree with the phenomenological approach, with respect to its call for creating an 'epoche' (i.e. blocking or eliminating the existence of any pre-understanding) while conducting research in an unfamiliar world. Such an operation seems to be unrealistic in the practical world; hence, instead here the hermeneutic approach seems to be more pragmatic if the above mentioned condition is fulfilled. However, principally the author agrees with the phenomenological approach in terms of its inspiration for 'abstracting the essence of the phenomena through inductive generalization', as it is also in line with the grounded theory.

## **2.2 A Detailed Account on the Sources of Data Collection**

It has been attempted to include the voices of the representatives of all major domains on relevant issues in order to facilitate their counterparts to better understand the real concerns and complexities involved in the shaping of telecom services. This attempt to open up the technological 'black box' (Rosenberg, 1982; 1994) through a continuous engagement of all the concerned and interested parties in a dialogue process is expected to result in a better exposure to the real dynamics of the diffusion process. The presumed complexities in studying the development of telecom market in the Pakistani context signifies the importance of employing the 'methodological pluralism' approach i.e. using both the quantitative (statistical results of surveys, graphs and tables) and qualitative research methods (detailed interviews, debates, informal talks, observations, archival analysis, and document analysis). The simultaneous use of the different quantitative and qualitative research methods is expected to help in exploring and explaining the complicated and intriguing details laying behind the articulated verbal expressions and written scripts. Here, an explicit account has been provided with further classification about the major sources of the collected data used for this research. Before the start of field work, a pilot study of a month (during February 2008) was conducted in order to collect an initial stock of data for the further preparation. The pilot study also helped in establishing some basic contacts within the telecom sector to conduct the following work.

### **2.2.1 Interviews**

During the four months of field work (2009/10) in Pakistan, 54 informed persons were interviewed in detail more like in a dialogue pattern; hence, producing 45 hours of 'recorded' hearings. The regulator (PTA) also organized a 'workshop' in its vicinity, where most of the interviewees from the policy, regulatory & supplier domains were invited for an initial introductory session about the project. This session helped in getting introduced with the key persons of the telecom industry in Pakistan, in addition to having the formal support in conducting this difficult task.

Domains	Number of Interviewees
Supplier Domain incl. telecom vendors & operators	19
Policy & Regulatory Domain	10
Supporting Domain	12
User Domain	13
<b>Total Interviewees</b>	<b>54</b>

Table 1: Number of Interviewees from the different domains

The interviewees were informed in beforehand about the fact that their interviews would be recorded only for the academic research purposes; however agreed on the condition that their individual names or designations would not be disclosed in any publications. A prior appointment has been made in each case so that they could have reserved an hour for uninterrupted discussions, since most of them were holding key positions within their respective public and private institutions. The numbers of conducted interviews are here classified (table 1) as per the different domains they essentially belonged to. The readers may also refer to table 4 for the further detailed information about the list of institutions whose personnel were interviewed, and whose perspectives have been included in this debate.

### 2.2.2 The Questionnaire Survey through ‘Workshop’ Sessions

A well-structured questionnaire (see Appendix 1) was carefully designed to receive a maximum amount of useful inputs and relevant information from the end-users for both the quantitative and qualitative parts of the analysis. The questionnaire was drafted so that the different parts consisted of not only the Likert-based (1-5 scaling) questions for the subsequent graphical and quantitative analysis; but also the qualitative part that asked for the textual feedbacks (through passing comments, critiques and recommendations) for the further qualitative analysis. The questionnaires were filled out by 355 respondents (mostly the college and university student aging 16-26 with an average around 21 year) from 6 different academic institutions located across the country. It is worth to remember here that the average or median age of the country is also 21 years. These well-organized and scheduled workshops were beforehand properly advertised by the respective university administration in each case. Out of the mentioned six academic institutions, 5 workshops were held in different universities in order to collect feedbacks from the graduate and undergraduate students (relatively more informed users), as they were mainly representing the academic disciplines of telecommunications and management studies. However, an intermediate college was additionally included in the workshop survey to also collect the teenagers’ perspectives.

The college and university students were targeted because they were supposed to be among the most enthusiastic and well-informed users, so they were expected to have actively participated with high motivation in the workshop sessions. In addition to that, as a matter of fact, in case of Pakistan the youngsters make the largest part of the mobile and broadband users. Hence, their feedback was expected to be not only a qualified feedback, but also representing the generalized pattern of the current usage of telecom services; and in addition to that reflecting the relatively informed and well-articulated concerns of the telecom consumers. Furthermore, since the case study essentially

represents a comparative analysis between the relative diffusion of three different telecom services; therefore it was assumed that a better comparison could be made by those users who have frequently made use of the all three services, and hence better aware of the basic tenets and major attributes of each service. The conducted workshops were split in numbers between a relatively less developed part of the country i.e. the Quetta city (the capital of Balochistan province); and on the other hand, the relatively more developed part of the country i.e. the capital Islamabad and the Punjab province. This carefully sampled distribution was deliberately planned to get a better reflection of the telecom usage pattern in the country. The workshops were generally of 60-90 minutes duration, where the first part was composed of a presentation from the author about the basic concepts and terms used in the questionnaire; in order to first make them familiar and comfortable with the task they were being given in the second session of the workshop. The general response from the audience has been found very welcoming and encouraging as it was obviously observed from their active participation and the delivered feedbacks on the questionnaires. Table 3 (chapter 4) explains the list of institutions where these workshops were conducted.

### **2.2.3 Observations**

‘Observation’ has been an important research technique for collecting the data and it greatly helped in strengthening the author’s analytical ability for going in-depth of the analysis. The author’s background for having a conscious living experience of more than two decades in Pakistan indeed helped him in better understanding the nuances and complexities of the public’s psychology, the cultural issues, and their likely attitude and possible reflections towards different inputs and the posed situations. The author remained very sensitive during the research to the events and incidents happening around his surroundings. However, all this ‘pre-understanding’ of the research context has neither been discarded; nor has been let to rule over the author’s analytical judgments, while also maintaining an unbiased position without having prejudices against any specific account. It has been tried at best to maintain a balance between objectivity and inter-subjectivity in order to create an honest and fair account through developing a better understanding of the different perspectives and the competing accounts on a number of conflicting issues. Finally, the audio-visual observations have been also made through carefully listening to the public discussions on different issues related to the diffusion of telecom services, and also zealously observing their usage patterns to notice both the positive and negative use of telecom services. For visual account, camera has been effectively used as an additional visual aid to those valuable observations.

### **2.2.4 Informal Talks and Correspondence**

During the four months of field work, the author was also engaged with teaching a course on ‘telecom economics, policy and regulations’ at IIUI, a university located in Islamabad. During this course, 12 dedicated students of the ‘telecom management’ discipline were actively engaged in a continuous mode of dialogue through class discussions and assignments. As part of their oral examination, they were engaged in an informal dialogue within groups of 4 students for long sessions. This whole experience and exercise helped the author in a great deal to effectively develop an understanding of the specific psychology, preferences, culture, and the usability patterns of the youth segment of society that essentially represents around 60% of the total population.

Secondly, a large pool of respondents were also kept engaged in informal talks both personally and on the phone, while maintaining with them an email correspondence as well, even after the field work had been formally completed; in order to get an updated account on different emerging issues which were found yet insufficiently explored. This practice helped the author in his continual search for the further data collection in order to continuously improve his understanding on certain issues, which actually rose during the first and second round of data analysis. These iterative cycles of communication with the respondents also helped in getting their fresh insights, since those later collected informal responses were often found to be more mature and precise in context of the debate. It has been found that often people reflect better on certain issues when they are put out of the formal research environment. They divulge more interesting information and make critical reflections when they are asked in an informal environment such as at the coffee shop or on the phone while spontaneously being asked the ‘unrecorded’ questions; since in that case they are likely to respond more genuinely without being extra conscious or manipulative in choosing the right words for avoiding any possible consequences of their statements.

### **2.2.5 Archival Analysis (News Reports, Research Papers & Internal Documents)**

For archival analysis, a big range of research papers and internal documents were gathered and read before and after the field research for cross-checking the authenticity of the presented figures and the statements, as often projected by the respondents during their interviews or in filling out the questionnaires. In addition to that, the author also went through a very large volume of (both online and offline) news paper reports and articles related to the development of the telecom market in Pakistan, which were published on different online blogs and newspapers over the last few years. These news clips often helped in opening up new angles and vantage points about the shaping of the telecom markets; and in result, adding on new perspectives on the existing list of issues and debates. This analysis genuinely helped in comprehensively covering the whole range of topics; in order to further sharpen the logical and causal relationships between the highlighted issues.

## **2.3 The Aim of the Current Research in Methodological Terms – Summarizing the Debate & Positioning the Research**

This thesis welcomes any pre-understanding, whether in form of theoretical insights; or an empirical exposure about the constructed reality of the researched case built on the past experiences, observations and interactions. The research regards any of such pre-understandings about the contextual complexities of the studied case, as a valuable source of data. However, the current thesis does not allow narrowly following any ‘preconceived notions’ or any theoretical source of inspiration in a rigid manner that might lead a researcher towards a biased attitude about the unexpected or differing opinions; since in that case the researcher would be less enthusiastic to looking for the ‘surprising elements’.

A typical example of the use of such preconceived notions is to believe in the predefined terms or predetermined stereotyping about an event, phenomenon, person, group, society or a segment of the society without having conducted any unbiased empirical enquiry or a rational investigation for digging out the reality. Hence, in doing so, a researcher might risk in getting trapped within his/her

own predefined mindset and an already built opinion about the reality, which actually had to be yet investigated. Some of such broader terms and notions that have been frequently used or were intentionally 'launched' within the social, political and economic contexts in the recent history with the support of a stringent media campaign are: modernism vs. fundamentalism, moderate vs. conservative, liberal vs. religious, and the other terms like; 'human rights', 'women rights', 'civilization', 'rigidity', 'enlightenment', 'liberalization', 'justice', 'equality' 'development', 'extremism', 'terrorism', 'democracy', 'liberty', 'reform', 'free markets', 'freedom of speech & expression', 'open-mindedness' etc., just to name a few. In the similar fashion, there might be other specific notions currently being used within the business world, particularly in context of the development of telecom market, the ongoing reform process, or the diffusion research itself (e.g. the debate about the conceptual demarcation of the scope of diffusion research); hence these preconceived notions are definitely required to be unfolded, re-discussed, and further explored in order to improve our understanding of the 'reality'. In the author's opinion, such terms, concepts and notions are often intentionally and socially constructed to protect the economic and political interests of some of the 'translators' with the help of these crafted words. The author further argues that often these 'translators' have been assigned the task to inscribe the desired 'meanings' of their interest into these crafted words and notions; to take the support of these notions within the diplomatic game or the exchange of 'rhetoric' in order to politically and morally marginalize the competing translations of the opponent groups.

Hence in order to conduct an independent and unbiased research, a researcher is supposed to get rid of any of such preconceived notions before plunging into the research field, which may jeopardize quality of the research. In diffusion related research, particularly in case of conducting the 'impact analysis'; it is imperative to avoid getting trapped into such preconceived notions in order to properly investigate the impact of the diffused services within the context of the socio-cultural values or the political and economic conditions of the focused unit of adoption. That would truly shed light on the actual reasons for the adoption or rejection of any particular innovation within a specific segment of a society or a targeted group of user community. Thus, it would help adapting with a specifically required or the desired marketing style and the pattern of media campaign; in order to effectively promote a product or successfully launch an idea within the targeted user community.

The current research neither makes any well-defined list of hypothesis from the onset, nor does it make use of the preconceived notions from the beginning of the research, based on the following mentioned list of facts, as perceived by the author. However, any 'pre-understandings' based on the past observations have been consciously allowed in order to make an effective use of them, but only to that extent they don't distort the actual, realistic and fact-based translations of the empirical data. Moreover, the following list of arguments further clarifies the author's position and his stand in terms of the adopted research methodology.

- Defining hypothesis in the beginning of the research is likely to imprison the following research behind the structured bars of preconceived notions; and it is like presuming the 'reality' as an 'object' placed out there in the field, which had to be opened up in an engineered way. However, the social world is far too complex to be investigated in this pattern; which means like presuming beforehand the expected outcomes of the 'black box' in response to the controlled inputs and the changed variables.
- Initial hypothesis often leads to an excessive structuring in an effort to control the input data and the expected amount of variables involved in the research. But on the other hand, too much structured and focused research leaves less room for the 'surprises' and for the induction of new elements in redefining the researcher's preconceived and crafted version of the reality. These new surprising elements often appear on a continual basis throughout the research work and even after the completion of the research; demanding that the researcher needs to keep open his/her mental gates to full-heartedly welcome any input at any stage, even if it challenges his/her initial understanding and notions about the expected shape of the preconceived reality.
- The actual world is considered here far too complex to be envisioned and captured before plunging into the targeted 'black box' (e.g. a specific telecom market) to unfold and divulge the reality about the construction and the functioning of the box in terms of its composing elements (actors) and their interconnectedness (relations and communication patterns). But this is only one part of the story, it remains important to also see the connectedness and existence of this small 'world' (the focused 'unit of analyses') in relation to the whole 'universe' of which it is a small part of. Any attempt to avoiding 'uncertainty' and 'complexity' through reducing the number of variables or cutting down the connected links in hope of 'simplification' is believed to be like distorting the actual 'facts', and the shaping of that socially constructed reality.
- Too much eagerness or having an ambitious approach towards finding the desired 'patterns' at an early stage of the research leads towards the commonly observed tendency of avoiding differing perspectives and deviations at a later stage. Hence, it demands for employing a flexible and adaptable research framework; since the later interventions and inferences based on the unexpected data and unforeseen events in the future context may dilute the very essence of the initially made preconceived notions altogether. Therefore this approach may eventually reduce the researcher's 'absorptive capacity' to adjust with the 'diversity' and deviations; and hence, it may lead towards a strong temptation to discarding the 'undesired' or 'misfit' elements from the collected data due to the likely presence of an inherent biased attitude towards the unwanted data or an unexpected research outcome. This may result in the loss of valuable insights and interesting results, which potentially could have revealed new dimensions and perspectives about the constructed 'truth'.

- Any ‘object’ (whether a ‘policy document’ or even a technological artifact) is actually a physical demonstration of a ‘constructed truth’ or the reflection of an ‘interest alignment’ process between the leading actors; as they eventually reach to a consensus (‘closure’) either based on a democratic dialogue or through an interest-led political bargaining process. To properly understand this political process of making ‘translations’, it requires that the researcher should have become an integral part of the ongoing ‘dialogue’ (or the rhetoric explanations) as an ‘unbiased’ participant who is only interested in understanding the ‘reality’ (what’s inside the ‘box’? and how it has been constructed? or how it should have been constructed?). However, defining hypothesis beforehand is like already disclosing the researcher’s agenda and his/her preconceived judgments about the expected shape of the truth, even before listening to the audience and to the different conflicting views (competing accounts) of the engaged parties; and hence it does not leave the researcher’s position nonpartisan in the forthcoming debates anymore. It even risks engaging in rivalry with those whose interests are seen to be likely damaged with the accounts offered by the researcher, before they were even being properly heard or asked about their perspective on the issue.
- Finally, the fact that the ‘truth’ or ‘reality’ cannot be defined in absolute terms in the social world, since it always varies with the specific context (time and space) of the application. Hence, the debate of this thesis is rather to look for the ‘relative truth’ within the different contexts; instead of looking for the ‘absolute truth’ in a nomothetic sense. Thus, the aim of this research is not to find the ‘absolute truth’ but to discover the ‘constructed reality’.

Therefore, based on the above line of arguments, this thesis does not aim at ‘testifying’ (or ‘falsifying’) any list of preconceived notions or hypothesis; hence, instead of being deductive and theory-driven, this research is more inductive and ‘facts’-driven, which are perceived to be grounded in the investigated field of research. Thus, this thesis doesn’t aim at architecting a model rigidly in line with the already learned principles, but it struggles to construct a model (theory) with the help of those who are to use it; while also open-mindedly getting inspirations from the lessons learned from the previously conducted other competing studies.

## Chapter 3

### Literature Review

This chapter provides an overview of the stream of literature that has been used as a source of theoretical inspiration for this thesis. The referred literature has significantly helped in building the basic theoretical foundation to address this challenging issue, as it refers to both the previous research work and the ongoing academic discourses on the innovation and diffusion related research. The author has remained quite open to receiving inspirations from any of the following mentioned list of literature. As reading this wide range of scholarly work, the author finds a basic rationale and a logical pattern in classifying them within eight different groups (or perspectives).

However, some of these perspectives have been referred in this thesis more extensively than the others due to the fact that the different streams of literature (or the varying perspectives) offer different scale of insightful discussions on the range of issues raised by this work such as: exploring the mutual communications and interrelationships between the actors (nodes) and their associated networks (connected links); visualizing the social and political shaping of the technological services and their diffusion within a unit of adoption whether it is a system or a society; understanding the interactive patterns of relations between the entities within the prevailing (functional/non-functional) systems, and the potential flaws and weaknesses of the systemic approach while dealing with a complex field; highlighting the socio-economic impacts of telecom services on different dimensions of the focused unit of adoption within which the diffusion study is desired to be conducted; identifying the inherent complexities and the internal dynamics involved in the diffusion of telecom service in a complex socio-economic context, representing a highly uncertain marketplace; strategizing and policy making for achieving a balance between both the social and economic objectives associated with the diffusion of telecom services; and finally projecting some future scenarios and technological trajectories in order to prepare for the possible changes through continuously learning from and adapting those changes in order to stay competitive as a firm in the marketplace, or as a society among the other competitive nations of the world.

The classified eight categories of different perspectives are:

1. The Social Communication's Perspective
2. The 'Systems of Innovation' Perspective
3. The Socio-Economic Impacts and Policy Implications' Perspective
4. The Comparative Benchmarking and Telecom (Policy/Regulatory) Reform's Perspective
5. The Econometric Modeling and Technological Forecasting Perspective
6. The Strategic, Technological & Business Modeling Perspective
7. Managing Complexity and Integrating Change Perspective
8. The Social Construction of Technology and Actor-Networks' Perspective



### 3.1 The Social Communication's Perspective

The classical work by Rogers (2003 5<sup>th</sup> ed.) titled as 'Diffusion of innovations' has been among one of the most widely recognized and referred book in the diffusion related studies, and it has been also considered as an authentic source of reference and a pioneering work on this discipline. He defines (p.5) diffusion as "the process in which an innovation is communicated through certain channels over time among the members of a social system." It is called a special type of communication in which the messages are concerned with the adoption of new ideas and products. Rogers (2003) further breaks down the proposed definition of diffusion into four main elements namely: the innovation; communication through certain channels; the time frame; and the social system within which diffusion occurs. These four main elements of the 'diffusion of innovation' process have been briefly discussed below.

'Innovation' has been perceived here mainly by its 'newness' perspective, and not by the 'commercialization' perspective as often referred by the 'systems of innovation' approaches. Here, an innovation has been considered as an idea, practice, or object that is perceived to be new within the specific context of an individual or other unit of adoption. 'Communication' has been defined as a process in which participants create and share information with one another in order to reach to a mutual understanding. A 'communication channel' is the means by which messages are being delivered from one individual to another. It includes the 'mass media' and 'interpersonal' channels. Mass media channels (radio, television, newspapers) are usually considered among the most rapid and efficient means of informing a targeted group of audience about the existence or emergence of an innovation, i.e. through creating 'awareness' among the masses. Whereas the interpersonal channels are more effective in persuading an individual to accept a new idea, especially if these channels link two individuals sharing similar attributes (i.e. among 'homophilous' units) e.g. with respect to their socioeconomic status, educational level, or other important ways. It involves face-to-face interactions and exchange of information through telephone/mobile or by using internet medium. The information exchange may take place either through objective evaluations based on scientific studies i.e. 'expert reviews' or through subjective evaluation through 'peer reviews' and 'word of mouth' propagation. Diffusion has been called a very social process that involves interpersonal communication relationships.

The element of 'time' in the diffusion process involves three critical dimensions: 1) the innovation-decision process by which an individual passes through the acquisition of firsthand knowledge about the innovation till its subsequent adoption or rejection; 2) the innovativeness of an individual or other units of adoption (the 'innovativeness' is here measured by the relative earliness in the adoption of a new product); and 3) the innovation's rate of adoption in a system (relative adoption or growth in terms of new subscribers within a benchmarked timeframe). The 'innovation-decision process' is essentially an information-seeking and 'information-processing' activity in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of the innovation. It is a process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to the formation of an attitude towards the innovation, to a decision to either adopt or reject, to implementation and the use of new idea, and finally to

confirmation of his/her decision. Hence, the innovation-decision process is perceived here as composed of five main steps namely: 1) knowledge, 2) persuasion, 3) decision, 4) implementation, and 5) confirmation. Whereas the second dimension of relative 'innovativeness' of adopters has been classified by Rogers (2003) again within five different categories namely: the innovators; early adopters; early majority; later majority; and the laggards. It has been further explained below with the help of an 'adoption curve' (see figure 7).

Finally, the 'social system' has been defined as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal. The members or units of a social system may be individuals, informal groups, organizations, and/or subsystems. Each unit in a social system may have further distinctions or differences with other units. However, all members of the perceived social system are assumed to be cooperating with each other at least to the extent of seeking to solve a common problem in order to reach a mutual goal. This sharing of a common objective binds the system together. Hence, as per Roger's (2003) approach, diffusion occurs within a 'social system'. The social system constitutes a boundary within which an innovation diffuses and the social structure of the system affects the innovation's diffusion through its prevailing 'norms', the respective roles of 'opinion leaders' and of the 'change agents', the specific types of innovation-decisions, and the consequences of innovation respectively. The structured or the patterned arrangements of the units in a social system give a certain degree of regularity, stability, predictability and accuracy within the adopting human and system's behavior. Hence, the structure of a social system can either facilitate or impede the diffusion process. Katz (1961) rightly comments that "it is as unthinkable to study diffusion without some knowledge of the social structures in which the potential adopters are located, as it is to study blood circulation without adequate knowledge of the veins and arteries" (Roger, 2003; p.25).

Here, 'opinion leadership' is defined as the degree to which an individual is able to influence other individual's attitudes or overt behavior informally in a desired way with relative frequency. Opinion leadership is earned and maintained by the individual's technical competence, social status, accessibility, and conformity to the system's norms; and hence they serve as 'role model' for the adoption behavior of their followers. Logically, the 'change agents' often first target these opinion leaders of a social system in order to turn the overall attitude of the targeted system in favor of the desirably diffused innovation. The 'change agents' are the individuals who influence clients' innovation-decisions in a direction deemed desirable by the 'change agency'. The change agents usually seek to obtain the adoption of new ideas but may also attempt to prevent the adoption of competing or undesirable innovations.

#### The Point of Departure for this Thesis

However, it is presumed that the scale of challenge would be much higher in case of conducting the diffusion research in a unit of analysis, where it is rare to find any obvious sign of 'joint problem solving efforts' on behalf of the members of a social system. In such a social system, it often appears to be the case that apparently the decision making attitude and the market behavior of the members of the social system (including the public and private institutions) simply doesn't share

any ‘common goal’ with each other that is desirably set to be achieved by those interrelated units. In such a complex socio-economic context, the particular research framework within which the diffusion research has to be conducted is required to be redefined and rephrased in order to compensate for the missing element i.e. the ‘systemic nature of the social system’. Hence, conducting diffusion analysis in that sort of complex socioeconomic context would essentially require quite a different set of analytical skills and research tools in order to fully understand and effectively address the involved scale of social-economic complexity; in addition to dealing with the pluralism of competing translations which offer less stability and high uncertainty during the diffusion process. The above mentioned situation rightly applies to the particular case of diffusion analysis what this thesis actually attempts to deal with.

However, Rogers (2003, p.6) also defines “diffusion as a kind of social change, which represents a process by which alteration occurs in the structure and function of a social system”. When new ideas are invented, diffused, and adopted or rejected; leading to uncertain consequences, the social change occurs. He considers both the planned and the spontaneous spread of new ideas within the diffusion studies. He elaborates further that the technological innovations are not always diffused and adopted rapidly, even when the innovation has obvious advantages (such as in case of comparing the keyboards based on the layouts of QWERTY and the Dvorak). A social system is involved in an innovation’s consequences because certain of these changes occur at the system level, in addition to those changes that affect the individuals. ‘Consequences’ are the changes that occur to an individual or to a social system as a result of the adoption or rejection of an innovation. The possible consequences as defined by Rogers (2003) of an innovation are classified in terms of

- Desirable versus undesirable consequences
- Direct versus indirect consequences
- Anticipated versus unanticipated consequences

Hence, this thesis attempts to thoroughly investigate the observed impacts and consequences of different telecom services, in context of a complex socio-economic context. However, an important conceptual and methodological issue has been raised here i.e. defining how to determine the boundaries around a technological innovation? The problem is how to define where one innovation stops and another begins (similar to the concept of ‘technological trajectories’ as discussed below). Hence, a ‘technology cluster’ (e.g. the ICT services) consists of one or more distinguishable elements of technology which are perceived as being closely interrelated. Rogers (2003) elucidates that the past research on diffusion has generally investigated each innovation as if it were independent from other innovations. However, he argues that this oversimplification represents a dubious assumption, in that an adopter’s experience with one innovation obviously influences that individual’s perception of the next innovation to be diffused through that specific individual’s adoption system; hence it refers to the significant effect of ‘path dependency’ (Nelson & Winter, 1982) on the diffusion process. In reality, the innovations which are diffusing at about the same time in a system are often interdependent. While it is much simpler for the diffusion scholars to investigate the spread of each innovation as an independent event, however this would be the ‘distortion of reality’ in the Rogers’ perspective. Hence, he asks for more scholarly attention to be

paid to studying the diffusion of 'technology clusters' in the future research. Thus, the current thesis is motivated by the given guideline; and hence accordingly attempts to compare the relative diffusion of different telecom services within the 'ICT cluster' during the same timeframe.

#### Perceived attributes of innovation

The characteristics of innovations, as perceived by individuals, help to explain their different rates of adoption. Rogers (2003, p.15) defines following five major attributes what he finds prominent in the diffusion of most of the innovations.

- 1) The 'relative advantage' which is defined as "the degree to which an innovation is perceived as better than the idea it supersedes". It may be measured in economic terms, but social prestige factor, convenience and user satisfaction are called among the important factors.
- 2) 'Compatibility' is defined as "the degree to which an innovation is perceived to be consistent with the existing values, past experiences, and actual needs of potential adopters".
- 3) 'Complexity' is "the degree to which an innovation is perceived as difficult to understand and use".
- 4) 'Trialability' is "the degree to which an innovation may be experimented with, on a limited basis". An innovation that is trialable represents less uncertainty to the individual who is considering it for adoption, as it is possible to learn by doing or experimenting first.
- 5) 'Observability' is "the degree to which the results or consequences of an innovation are visible to others". The visibility stimulates peer discussions about the new idea.

Finally, the 'adaptability', even though not listed among the main attributes by Rogers (2003), but it can be perceived as the sixth attribute since he discusses it separately in the following discussion. Though somewhat close to the concept of 'compatibility', however, this attribute defines "the product's degree of 'customization' as per the user's specific needs and context of usage". Similar to that concept is the term 'reinvention' which is defined "as the degree to which an innovation can be changed or modified by a user in the process of its adoption and implementation" (p.17). An 'interactive' and 'user-driven' innovation is not supposed to be a passive entity to be implemented in isolation of the user's involvement. Many adopters want to participate actively in customizing an innovation in order to make it fit with their unique situations. Rogers (2003) generalizes that those innovations which are perceived by individuals as having greater relative advantage, compatibility, trialability, and Observability and less complexity will be adopted more rapidly than other innovations. The first two attributes i.e. the relative advantage and compatibility, are particularly important in explaining an innovation's rate of adoption. Some diffusion scholars want to utilize the existing scales and the already defined attributes as developed by other investigators, but Rogers (2003) discourages this approach in favor of creating new scale items for each set of innovations to be adopted by a particular set of individuals or user communities. He elucidates that the specific ways in which the five attributes are expressed differs in each study; and hence the measures of these attributes should be uniquely created afresh in each investigation. He seems quite right saying that; these are the users' or adopters' perceptions about the desired attributes of an innovation, and not those attributes as classified objectively by the experts or change agents, which actually affect the rate of adoption of that particular innovation. Hence, he proposes that the diffusion scholars

should keep an open mind towards other possible attributes that may also be critically important in a specific situation for a particular set of individuals or communities, adopting a unique set of innovations. In light of the above inspiration, this thesis defines 47 different attributes (as inductively drawn from the field data) that are perceived to be playing a critical role in the diffusion of telecom services in the case of a complex socio-economic context, as observed in Pakistan.

### The Adopters' Categories

Rogers (2003) defines five different adopters' categories based on their 'innovativeness' in terms of their relative earliness in the adoption of new innovations. Among the five categories, the first category is quite small and is known as 'Innovators', that represents the initial 2.5% of total number of adopters, also referred as the venturesome consumers (the icebreakers) in the adoption of any new technology when available in the market. They are the pioneering 'trendsetters' who play a 'gatekeeping' role in the flow of new ideas into a system. The next adopter category is 'early adopters' which composes 13.5% of the total consumer market; and they are more integrated part of the social system as compared to the 'innovators'. This category has the highest degree of 'opinion leadership' in most systems. They are seen by the 'change agents' as the local missionary serving as role model to trigger the 'critical mass' for speeding up the diffusion process. Their positive opinion is respected among the masses as 'stamp of approval', due to their significant position in the society and its collective decisions making process. Followed by the early adopters, the next adopter category is the 'early majority' which makes the critical 34% of the adopter's market that adopt the innovation just before the average member of a system decides to jump in. This category frequently interacts with their peers and holds a unique location between the very early and relatively late adopters. They provide interconnectedness in the system's interpersonal networks; however they follow with deliberate willingness in adopting an innovation, but seldom lead the adoption process.

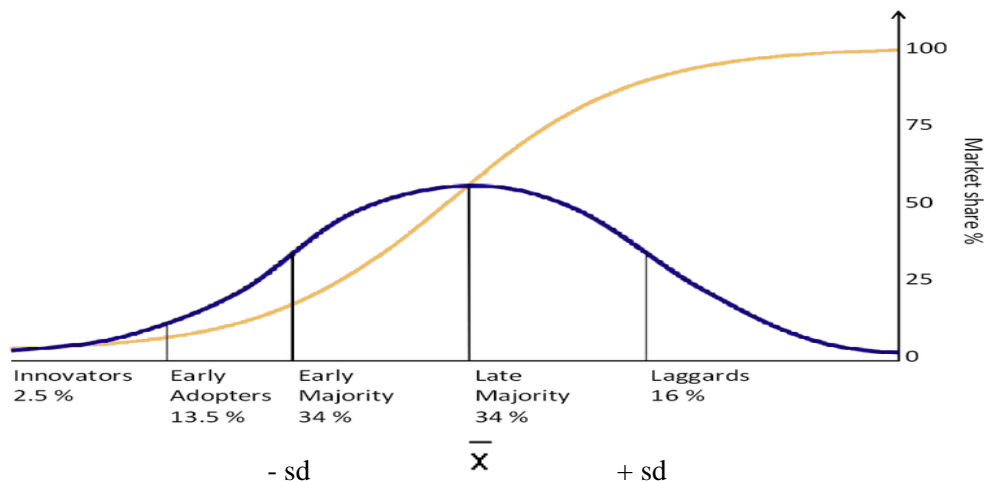


Fig. 7: The S-Shaped Adoption Curve (Yellow) and the Adopter's Categorization (Blue) in terms of relative Innovativeness and Standard Deviations (sd) from Average Adoption time  
Source: Rogers (2003)

The fourth category of adopters is known as the 'late majority' that makes the next large pie (34%) of the adopter's market, and their adoption is the result of both an 'economic necessity' (i.e. a real

need following the ‘affordability’ factor) and an increasing ‘peer pressure’ (i.e. the social pressure under the ‘risk of isolation’ if delayed in adoption, as especially valid in case of telecom services). They are highly skeptical and conscious about the consequences of adopting an innovation; and hence only adopt a product, which is perceived to have the least uncertainty and relative risk in terms of economic loss, social conformity and potential health hazards. The final category is named as ‘laggards’ which composes the last 16% of saturating market. They are generally dissociated and detached from the general market’s trend and only follow an innovation when there is no alternative left to choose from, in order to maintain their survival in a society. They show the highest level of inertia and resistance to any new idea that leads towards a possible ‘change’, as they extremely feel uncomfortable adopting change or adjusting with any new or emerging reality. Hence, they take the longest time in completing their innovation-decision process. The innovation-decision for either the adoption or rejection of an innovation are taken by either: 1) an ‘individual’ (i.e. optional for any individual to either adopt or reject an innovation without any social or legal consequences); 2) by a ‘system’ i.e. a collective decision based on the consensus among the members of the social system; or 3) by an ‘authority’ possessing formal or informal power based on political mandate, social status or technical expertise in order to make decisions on behalf of an unit of adoption.

In light of the above discussions, Rogers (2003) illustrates the following list of variables what he perceives essentially determine the rate of adoption or diffusion of an innovation in a given context, with more or less a universal validity.

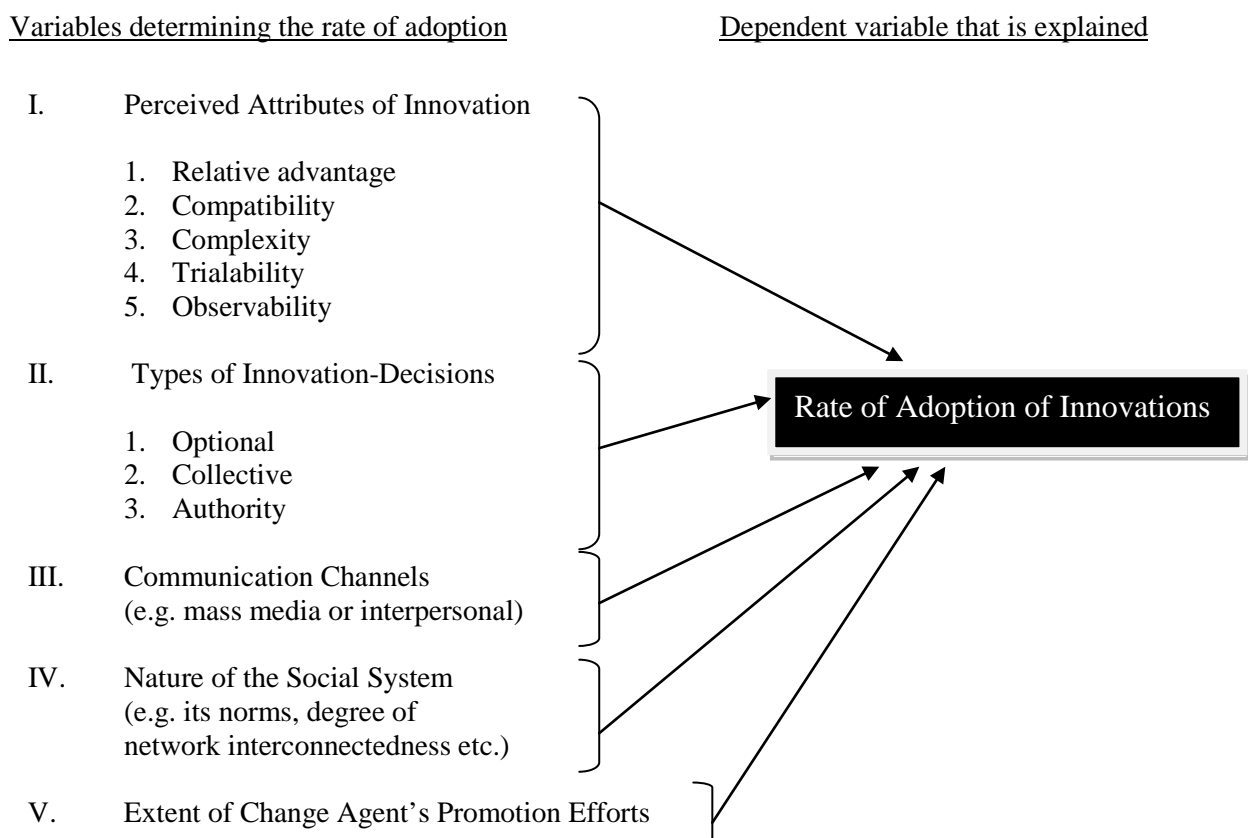


Fig. 8: Variables Determining the Rate of Adoption of an Innovation (Source: Rogers, 2003)

Dearing and Meyer (2006, pp.30-31) largely follow the Rogers' school of thought on diffusion research. However, they depart from the traditional approach on diffusion research saying that "the traditional approach to explaining diffusion often positions the adopters in a 'reactive' mode as socially-connected receivers and evaluators of new ideas and objects, but the new theories about diffusion suggest that adopters do more than being an active or reactive adopters, depending on the innovation in question, in influencing others or being influenced by them." They further argue that "the potential adopters can also be full 'partners' in the creative process of innovating as a result of actively framing the 'meaning' of innovations, trading ideas back and forth both as innovation sources and innovation receivers, and by exploiting opportunities and constraints in the information and social environment." It has been called essentially "a broad multidisciplinary issue of adopter activity; however the current formulations of adopter activity are mostly relegated to social interactions and not interaction with an innovation". Hence Dearing and Meyer (2006, pp.30-31) depart from the traditional approach to diffusion research by focusing on adopters as creators of innovations (within the user-oriented, user-participated and user-driven innovations), a view of 'democratizing diffusion for the public benefit'. Moreover, they explain that "the traditional view on the diffusion of innovations decouples the process of innovation from the process of diffusion". On the other hand the theoretical perspective they propose here "closely weds the two together for the purpose of detailing a means of 'making a difference' in social conditions" (i.e. by focusing on the resulting impacts and change on the society in result of adopting an innovation). This approach to diffusion research resembles to the present author's approach towards 'innovation', as the author also perceives the innovation process, particularly in case of the network technologies such as telecommunications, as essentially composed of 3-D process i.e. the Development, Deployment and Diffusion of an innovation. Furthermore, the current author also perceives mapping of the impacts and consequences of an innovation (both positive and negative), as essentially an indispensable part of the diffusion analysis.

Dearing and Meyer (2006) further comment that "the particular context in which we assess adoption activity is a problematic and multidisciplinary domain of translational research." They define the translational research as "the study of how evidence-based practices, programs, and campaigns can best be communicated for adaptation by program staff and intermediaries for the benefit of their constituents." They further argue that "while the traditional approach to diffusion scholarship popularized by Katz (Katz and Lazarsfeld, 1956) and Rogers (1962), and tested and explicated by them and others has clear implications for advancing the translational research; however the traditional approach show deficiency in certain respects in addressing this issue". Hence, they (p.31) advocate that there is a "need for a 'hybrid orientation' to the intervention-based study of the diffusion of innovations while acknowledging and emphasizing on: 1) the enduring role of centralized change agencies seeking for social betterment; 2) variance among the program staff not just as adopters but as innovators; and 3) 'innovation specificity' as critical concern of program developers and change agencies in pursuit of external validity and diffusion."

Srinivas (2006, p.151) takes a similar stand on the issue concluding that “diffusion of innovation theory emphasizes the ability of media messages and opinion leaders to create knowledge of new practices, and persuade the target audiences to adopt the ‘exogenously introduced’ innovations. The notion of exogenously induced social change was implicit in diffusion practice and research.” Quoting to Rogers work on diffusion, Srinivas (2006, pp.151-152) elaborates that “the earliest definition of development was a type of social change in which new ideas are introduced into a social system in order to produce higher per capita incomes and better standard of living through adopting modern production methods and improved social organization. Modernization or the development of an individual and society was perceived as the process by which individuals and other units of adoption change from a traditional way of life to a more complex, technologically advanced, and rapidly changing life style. The necessary route for this change from a traditional to a modern man was understood as the communication and acceptance of new ideas from sources external to the social system. In this context, communication was visualized as the central link through which exogenous ideas entered the local communities”. Srinivas (2006, p.152) also critiques here on the inherent deficiency of the traditional approach on diffusion saying that “over the time the diffusion theory is proved to be inadequate as a guide for communications planning in development campaigns.”

Srinivas (2006, pp.166-167) rightly assesses, in the present author’s view, that “empowerment through participation, grassroots organizing, and/or dialogic action may take a long time to mature and achieve significant results; and hence achieving empowerment cannot be presumed an easy task. It requires dealing with enclaves of power and influence that are deeply anchored both in the local and global power structure. It also involves an active participation of individuals and communities in intervention efforts affecting their welfare. However, it is the right thing to do if we are fully interested in appropriate and sustainable change.”

### **3.2 The ‘Systems of Innovation’ Perspective**

Edquist (2003) sheds light on the internet and mobile telecommunications ‘Systems of Innovation’ in terms of their equipment, access and content development status, more from the sectoral perspective. He focuses on the cases and respective implications of the deployment of fixed, mobile and internet services from ‘systemic perspective’ on Europe in comparison with other developed nations of the communication world. The book defines (p.1) the ‘Systems of Innovation’ (SI) as including “all important economic, social, political, organizational, institutional and other factors that may influence the development, diffusion and use of innovations”. Since these factors can be studied in the national, regional or sectoral contexts; hence, the ‘National’ (Lundvall, 1992; Nelson, 1993), ‘Regional’ (Cooke, 2001) and ‘Sectoral’ (Carlsson, 1995; Malerba, 1999) systems of innovation may coexist and complement each other, as these three systemic level of frameworks are essentially the different variants of the generic systems of innovation approach (Edquist, 1997). Each of these different variants of SI approaches are seemingly quite focused and convinced about the inclusiveness of all the important elements and influential factors of innovation processes within their respective boundaries. However, Edquist (2005, p.182) considers the ‘organizations’ and ‘institutions’ as the main components of each systems of innovation. He defines organizations as



“the formal structures that are consciously created and have an explicit purpose.” Organizations may be the supplier firms or non-firm entities such as universities and public bodies. On the other hand, the institutions are defined as the “set of habits, routines, established practices, and the rules or laws that regulate the relations and interactions between individuals, groups and organizations”. These organizations and institutions are considered as essentially the basic components of these complementing systems, which aim for the creation and ‘commercialization’ of knowledge.

Edquist (2005, pp.183-187) further argues that as per the systems of innovation approach, if all the factors that influence the innovations processes (during its development, diffusion and use) were not included, then deciding which potential factors should have been excluded might have proved to be a difficult and dangerous task, as we don’t know systematically and in detail the relative significance of the range of determinants of innovation at each stage. The six relative strengths of SI approaches are mentioned as: 1) focus on learning and adapting; 2) holistic and interdisciplinary; 3) historical and evolutionary; 4) interdependence and non-linearity; 5) dealing both product and process innovations; and the 6) emphasized role of ‘institutions’. The weakness of SI approach has been told that the approach suffers from conceptual diffuseness (ambiguities) on some issues and concepts, like disagreement on the definition of the term ‘Institution’ within different SI approaches. Another weakness is its unclear stand on what exactly should be included within a ‘systems of innovation’ and how to specify the boundaries of the systems. Hence, some authors argue to keep the boundary definition open and flexible to accommodate the continuously changing shape and blurring nature of these system boundaries, due to the emergence of new actors and changing relations as systems evolve over time. This in result leads to find new links and patterns of interaction between the emerging and existing actors, within and across the boundaries of the future envisioned or emerging ‘systems of innovation’ frameworks. In lights of these arguments; Edquist (2005, p.186) concludes that the “Systems of Innovation should only be considered as a ‘conceptual framework’ i.e. a ‘perspective’ or an ‘approach’ towards managing innovations, but it should certainly not be a candidate to be called a formal ‘theory’, in the sense of providing specific propositions regarding causal relations among variables. It can be limitedly used for formulating the empirical conjectures due to the absence of well-established empirical regularities”.

Hall (2005, pp. 459-460) explains that “without diffusion, innovation would have little social or economic impact. In the study of innovation, the word diffusion is commonly used to describe the process by which individuals and firms in a society or economy adopt a new technology, or replace an older technology with a newer one. But diffusion is ‘not only the means’, by which innovations become useful through being spread in a whole population, it is also an ‘intrinsic part of the innovation process’; due to the fact that learning, imitation, and feedbacks that arise during the spread of a new technology largely affect and help enhancing the original innovation”. Hall (2005, pp.478-479) describes that traditionally diffusion has been treated “as one of the three pillars on which the successful introduction of new products, processes, and practices into society rests, along with invention (a new idea) and commercialization/innovation (reducing the invention to practice)”. However he perceives that “diffusion in some ways is the ‘easiest’ part of the process to study, because it is more ‘predictable’ from observable factors than the other two (i.e. the

‘development/invention’ and ‘use/application’ of innovation)”. He further elaborates that “countless studies on the diffusion of individual innovations exist exhibiting some commonalities, such as the familiar S-shaped diffusion curve, and the importance of both economic factors & social networks”.

Hall (2005, p.479) argues that “although many have criticized the linear model that lies behind the division of innovative activity into three parts as oversimplified; it remains true that without ‘invention’ it would be difficult to have anything to diffuse, so that the model still serves as an organizing principle, even if we need to be aware of its limitations.” The significance of the users’ and contextual feedbacks have been however acknowledged by system theorists accepting the need to study the specific innovation’s utility/use under varying conditions, and across different users and geographical areas in order to use these insights to further improve the innovations. It has been further argued that “most of the studies conducted to date on this research area have been found methodologically rather simple; but there is a need for an approach that is structural but also grounded in the choice problem actually faced by the adopters”. He (p.480) further argues that “there is a room for further research in this area, as the diffusion of technology is an important source of economic and social development. Indeed, from a welfare perspective, one of the most important areas for further study is the comparative diffusion of innovative services and practices’ across the developing countries, especially because it is apparent that there are wide variations even among similar low income countries in terms of the relative rates of adoption”.

Innovation has been considered in the SI approach more in terms of ‘commercialization of the invention/new idea’ than merely in terms of the generation of ‘new idea or practice’; hence the systemic approach connects the research lab with the market (involving the end-user), and with other organizations; as either considered to be internal or external to the perceived boundary of the focused innovation system in a given context. Thus, looking from this perspective, diffusion has been largely understood theoretically as a sequential stage of a ‘linear’ model. However, the point to be understood here is the fact that it seems a bit unrealistic, studying the innovation in that linear way; or possibly by attempting to preclude some elements of the discussion for the sake of simplicity that may potentially influence the development, diffusion and the ‘use’ of an innovation. It is presumed by the present author that all these stages are in fact tightly interlinked and entangled with each other, which cannot be effectively studied in a linear way; and hence it requires a research skill to handle this complexity altogether. Secondly the author also objects on treating the ‘use’ of innovation as an activity outside the boundary or scope of the diffusion research; since adopting such an approach would basically misconceive (or misinterpret) the very essence of the ‘diffusion’ process, as it would then essentially assumes the diffusion process equivalent to a marketing or promotional campaign aiming at the rapid adoption of an innovation in the statistical terms, within a given context; but without understanding the local context, relevant usage and applications, effectiveness/usefulness, and the resulting impacts of the diffused innovation on the adopters. In this context, it seems more rational to consider innovation as an interactive feedback loop, composed of different learning cycles that essentially connect the inseparable three intertwined stages or elements of the 3-D innovation process (i.e. the development, deployment and diffusion of innovation) right from the beginning till the end of an innovation process.

Finally, within the systemic frameworks, Fransman (2007) draws a model that highlights the symbiotic relationship between the four major groups of players in the new ICT Ecosystem. He insists on the inadequacy of the current policy and regulatory frameworks in comprehensively addressing the range of issues relevant to the innovations within the ICT markets, in the wake of an emerging new 'ICT Ecosystem'. Hence the need for a rethinking process for the design of a more appropriate conceptual framework has been highlighted, both for the policy and governance purposes. He defines the perceived new ICT Ecosystem as composed of four groups of players and six different types of interactions named as 'symbiotic relationships'. The four groups of players included the: network operators; networked element providers (equipment manufacturers and network suppliers); platform, content and applications providers; and finally the ICT consumers. The patterns of the envisioned symbiotic relationships are depicted here in figure 9. However, this model essentially lacks the inclusion of other important stakeholders and focal actors belonging to the policy, regulatory and supporting domains that may possibly play a critical role in the shaping of new perceived ICT Ecosystem.

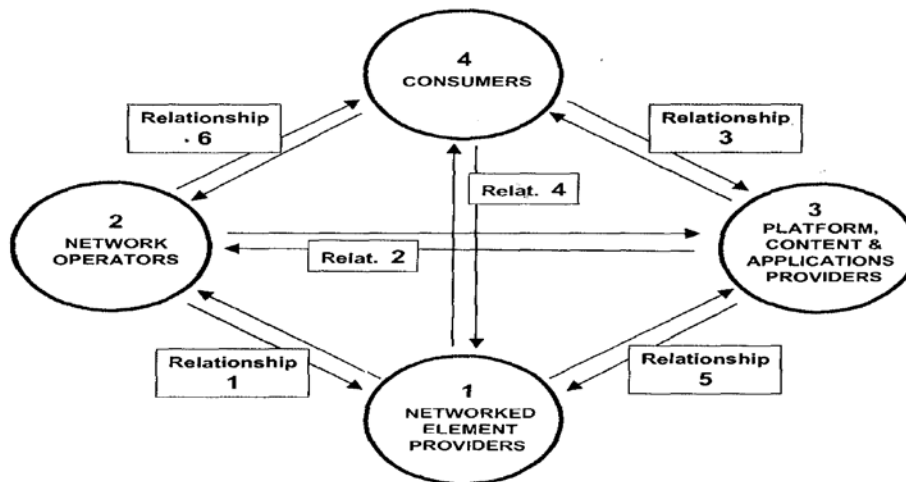


Fig. 9: Symbiotic Relationship between the Four Groups of Players in the New ICT Ecosystem  
Source: Fransman (2007)

### 3.3 The Socio-Economic Impacts and Policy Implications' Perspective

This stream of literature has predominantly focused on the social, economic and political impacts of the diffusion of new technologies on the society as a whole; and hence the resulting policy implications to take the corrective measures accordingly; in order to align the intended and resulted impacts of the diffused technologies within the focused units of adoption. Castells et al. (2007) debate the diffusion of mobile and wireless technologies across the world in terms of their social consequences, while differentiating the user communities in terms of their demographic, socioeconomic, gender, and ethnic distribution in a society. The study rises a range of interesting questions, actually much in line with the current thesis, however it suffers from the fact that the study mostly relies on the already available secondary data sources. On the contrary, the complexity of the raised issues did actually demand a couple of detailed case studies to cross verify the data available from the media sources, public sector, consulting businesses and the private research

institutions. However, Castells et al. (2007, p.3) acknowledge the fact that “the amount of comparative knowledge available on this subject has been found too limited to grasp empirically the emerging trends that are transforming communicative practices”.

Some of the interesting questions posed by Castells et al. (2007, pp.1-3) are relevant to be reiterated here as they seem to be quite in line with the investigations made by the current thesis. A fundamental question has been raised by them that “how the friends’ and family life, professional communication and academic interactions have been affected by the ability of the individuals to pursue fairly independent activities through using ICT devices and services in their own premises; and yet to be constantly in touch and maintaining relations with their respective family members and friends, as well as remaining attentive to their professional circles and academic connections without jeopardizing the strength of their social and professional ties? How do the individuals maintain their privacy in the presence of ever expanding professional interactions without time and space limitations; and getting benefit from the changing patterns of learning and education in the new interactive scenario”? The question has been raised about the new emerging ‘youth culture’ that comes with its own language and specific expressions. It has been investigated that “what are the new ‘inequalities’ (digital divide’) introduced by the differential access to the ICT infrastructure and available services? Why do the users of the technology often end-up using the adopted technology for the purposes very different from those initially sought or conceived by the designers or the promoters of technology”? It has been argued that “people, institutions, and businesses have suffered enough from the prophecies of futurologists and visionaries who promise and project whatever comes into their minds based on anecdotal observations and ill-understood developments”. It is further argued that consciously responding to these serious questions would affect our lives; but often it has been observed that the suppliers, policy makers and adopters make decisions without profoundly having thought about the resulting impacts and the consequences of their decisions.

Castells and Cardoso (2006) discuss the ongoing transition of global societies towards becoming a full-fledged ‘network societies’ and ‘knowledge economies’ due to an increased access and connectivity with the information sources and the prevailing use of ICT services in the society; and hence, they also study the resulting changes and implications on the policy domain. Policy has been called a strategic choice in order to deal either with uncertainty in the future context or with a reality that is already faced by the population. It has been further argued that policy making is increasingly becoming important and at the same time a challenging task due to facing difficulty in correctly interpreting and understanding the ongoing changes to effectively address them by adapting with those changes accordingly. The study presents a cross-cultural comparative perspective of the United States (US), and several other Latin American and European countries. Katz (2008) also follows the above line of argument in his debate in terms of the social and cultural implications of an extensive mobile usage on the society as a whole, and particularly on the user communities.

Skouby, et al. (1995) discuss the social and economic implications of telecommunications within the Danish context; however they also discuss three cases of the developing and transitional

economies. They correlate the shares of individual economies and their growth potential with the development in the international ‘division of labor’. In their view, it involves discussions about the restructuring of the sectors, in result of the development of new types of products based on new forms of cooperation (alignment) between the private sector firms, as well as between the public sector and private sector firms. It also requires development of new qualification profiles for the employees. Skouby et al. (1995, p.8) argue that “the technological integration for the production and supply of telecom services needs to be followed by an active political coordination” (i.e. the proactive role of the policy making institutions). They believe in the dynamics of their proposed ‘triangle’ of innovation policy in terms of policy implications; i.e. effectuating a result-oriented coordination between the ‘industrial policy’, ‘labor market policy’ and ‘telecom policy’ so that the respective policies could reinforce each other in good harmony to fulfill the desired needs. However, the current author would like to also include within the proposed ‘triangle of innovation policies’ the economic (financial) policy, research & innovation or science & technology policy, and the educational policy. Skouby et al. (1995) further debate the need for setting up national priorities and making room for the local initiatives in the presence of an ongoing trend towards regional cohesion between the EU (European Union) countries for the development of a common EU policy framework in all the economic sectors, including the telecom sector. They highlight an increasing need for the proactive policy coordination in order to inline the telecom policies with the developments across the other economic sectors. It has been insisted that the conflicting goals (e.g. ensuring the overall coherent network on the one hand, in parallel to enforcing rules for inter-operator competition) need not to be considered contradictory; if the policy and regulatory institutions take care of the both dimensions.

Finally, within this stream of the referred literature, Ling (2008) examines the effects of instant and perpetual access to mobile communications on the social bonding. Based on the empirical data accumulated from extensive interviews and observations, he concludes that mobile communication helps to engender and develop social cohesion within the family and peer group of friends, as like glue to the society that binds them together. He argues that mobile communication strengthens social ties within the social circle; however, sometimes at the expense of interactions with those who are physically present in the immediate vicinity. This effect of dissociation and detachment with the surrounding physical space, while being connected to the virtual world of communication through ICT gadgets has been discussed in the current thesis as well.

### **3.4 The Comparative Benchmarking and Telecom (Policy/Regulatory) Reform’s Perspective**

Many international organizations and research communities like IDRC, WDR, InfoDev, World Bank, ITU and LIRNE<sup>11</sup> are motivated for realizing telecom reform initiatives primarily from the policy and regulatory perspectives across the world, with an increasing focus on the developing economies. In order to achieve their goals, they often conduct surveys to make comparative

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<sup>11</sup> IDRC, WDR, ITU and LIRNE stand for: International Development Research Centre; World Dialogue on Regulation, International Telecommunication Union; and Learning Initiatives on Reforms for Network Economies respectively.

benchmarking using different dimensions across the sectors, regions and countries in order to find out some interesting patterns of development as a guideline for the future planning and initiatives. One of such active research organization is called LIRNE (Learning Initiatives on Reforms for Network Economies), which has the regional presence in different parts of the world; and hence LIRNEasia (based in Sri Lanka) organizes the research activities to measure the pace of ICT related developments across the Asia-Pacific and South-Asian regional countries using comparative benchmarking methods. It conducts the structured surveys (known as ‘Telecom Regulatory Environment’- TRE survey) every second year since 2006, and makes the follow up publications on the country basis. The last two survey results as published in 2007 and 2008 have been thoroughly revised for this study in order to get an impression about the sector-specific development in Pakistan in comparison to other regional developing countries. The TRE survey measures informed stakeholders’ perceptions about the regulatory and policy environment with regard to the telecom sector in a given country. It uses seven different dimensions for benchmarking: 1) market entry 2) access to scarce resources 3) interconnection 4) tariff regulation 5) anti-competitive practices 6) universal services and 7) quality of service; in order to gauge the developments within the fixed line, mobile and broadband services. The TRE survey assumes that by measuring these 7 core dimensions of the telecom sector; the scale of sector-specific developments and the relative diffusion of the compared telecom services can be assessed within any specific country, and can easily be compared with the other regional countries to reach to some meaningful conclusions.

<b>Dimension</b>	<b>Mobile</b>	<b>Fixed</b>	<b>Broadband</b>	<b>Average for Dimension</b>
Market Entry	3.9	3.0	3.2	3.3
Access to Resources	3.5	3.1	3.2	3.3
Interconnection	3.7	3.2	2.9	3.3
Tariff Regulation	3.2	2.7	2.6	2.8
Anti-competitive Practices	2.8	2.4	2.4	2.5
USO	3.2	2.8	2.0	2.7
QoS	3.2	2.7	2.7	2.9
Average for Sector	3.4	2.8	2.7	-

Table 2: TRE Survey Results for the Year 2008 for Pakistan

Source: Wilson (2008)

The 2008 survey results as mentioned in the above table for Pakistan is based on the participation of an informed group of participants from the telecom industry (46 respondents), who assessed the regulatory and policy environment along these 7 dimensions on a Likert scale of 1 to 5 (where 1 refers to the presence of a highly ineffective regime and 5 refers to a highly effective one). These different dimensions have been further discussed in detail in the forthcoming chapters of the case study. The above survey results also clearly reflect the reasons why the mobile services have experienced relatively much higher growth as compared to the other two telecom services, as the performance indicators of mobile sector clearly stands above than the other two services on all different dimensions. Ruth et al. (2004) have also used the different accessible tables and statistics to determine telecom diffusion capabilities of the developing nations of Middle East and North Africa (MENA), while focusing on the observed issues of ‘bandwidth crunch’ and ‘digital divide’.

However, merely depending on a quantitative measure has a potential shortfall in terms of oversimplifying the inherent complexities of the socially constructed world in numbers, somewhat in a similar fashion like weighing a mass in kilograms or mapping a physical height in meters. One may use this approach as an additional source of input in order to develop some graphical shapes and interesting patterns to be illustrated in order to make things more visible and understandable; however, unless the results of these surveys are qualitatively cross-verified by conducting detailed interviews, dialogues, observations and employing other investigative tools, it seems somewhat an incomplete investigation that only partially discloses the reality. Hence, the current author would prefer taking a different stance here by complementing the survey results and the statistical analysis with a detailed qualitative treatment of the focused case both for the data collection and the subsequent analysis; in order to cross-verify the reliability and validity of the results achieved by each method. Here, an example is given in order to further explain the point. Take the example of the above case where the table refers that the ‘market entry’ possibilities are highest in case of mobile services (with lowest scale of ‘entry barriers’); whereas it reports the lowest ‘market entry’ possibility for the fixed line (i.e. referring to relatively higher entry barriers for the new players). However, the referred report doesn’t further investigate in full account the whole range of factors and the possible variables that may have possibly influenced on the respondent’s perception while scaling the compared services in terms of measuring the market entry possibilities and barriers. These range of factors and variable may possibly include the higher license fee issue, bureaucratic hurdles, Rights of Way (RoW) issues, aggressive lobbying by stronger market players, the involvement of vested or personal interests of the engaged authorities, infrastructure sharing problems, prohibitive CAPEX (Capital Expenditure) or excessive OPEX (Operational Expenditure), the technological complexities involved in network deployment and service provision, the range of anticompetitive practices committed by the incumbents and large players, and the depleting margins due to the cut-throat price competition, just to name a few.

Secondly all the variables are often observed tightly intertwined and entangled with each other which makes it a risky approach to objectively quantify one variable at a time, while precluding the other connected dimensions and variables from the debate or equation in order to make the things simpler. Hence, arguably the reality can be better understood when it is studied and observed in its full ‘complexity’ instead of breaking down the facts into predefined structures or within tightly controlled research programs in hope of ‘simplifying’ the complexity. The third critique follows the assumption that the data of different geographical countries with quite different socioeconomic contexts cannot be simply compared using a standard set of benchmark due to the fact that until the results are analyzed within the context of the whole range of influential factors and variables including the socio-economic and geo-political elements which are often highly eccentric and idiosyncratic as per the case-specific attributes; hence making such cross-country comparative evaluations has been viewed by the author as potentially a vulnerable approach.

Giving an example of internet diffusion in the above context, apart from the obvious comparable factors such as the relative literacy rate (again it depends how it is benchmarked in each country) and affordability issue (in terms of GDP/capita); the impact of ‘load shedding’ (power failure or

breakdown several times a day for long hours) on the internet usage, for example, cannot be the same whole across the region, which has been observed severely affecting the internet usage pattern in some countries. Similar to that the relative scale of social resistance (cultural or religious barriers) faced by internet diffusion at the societal level due to the inherent social and moral issues associated with the specific types and patterns of internet contents, usage and applications; as perceived by the general masses, is simply not the same or even comparable while keeping the religious and conservative societies on the one hand, and the relatively more liberalized and secular countries on the other hand. Hence, the point is reiterated here that in order to fully grasp the complexity of the diffusion research, merely depending upon the quantitative approach won't generate an authentic account capable of grasping the full scale of intricacies and dilemmas involved especially in case of conducting such analysis in a complex socio-economic context.

Melody (1997), who is also the founder of the LIRNE research group, has discussed the underlying principles and rationale behind the recent move towards the policy and regulatory reforms across the countries. He discusses the need for designing an optimal institutional structure to address both the social and economic objectives related to the diffusion of telecom services. He argues for an effective separation of the operators (the supplier domain) from the governmental interventions by adopting his proposed decentralized structure of telecom reform, as depicted in figure 10.

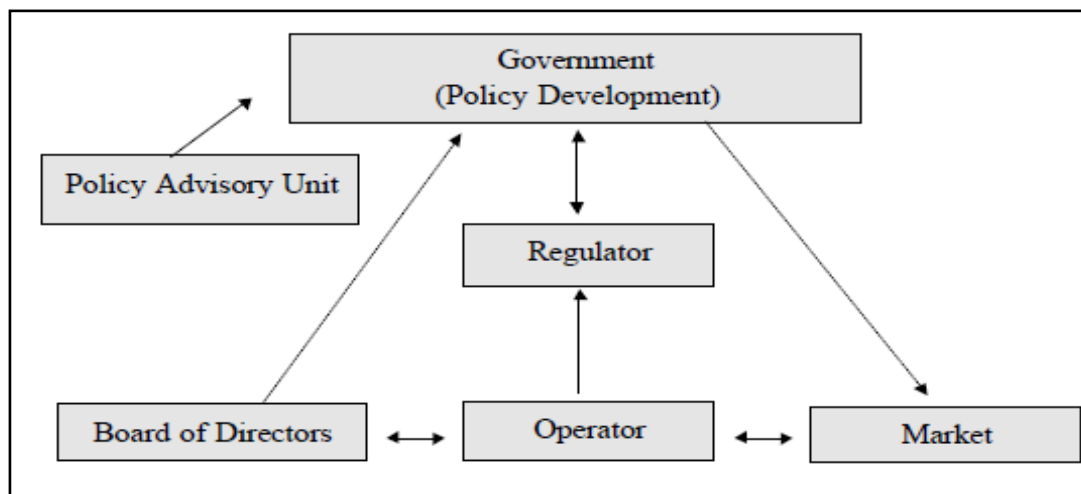


Fig. 10: The Decentralized Structure of Telecom Reform

Source: Melody (1997)

Melody (1997) further argues that the effectiveness by which this fundamental separation of basic functions (policy and operations) is achieved will have a significant impact upon the growth of telecom sector. His approach essentially seems inspired by Laissez-faire model that demands the market separation from the government interventions. In Melody's perspective, the effective is the separation, the better would be the climate to attract financing and undertake investments. He further explains that if each function performs well within its own scope, each will provide clarity and stability in an institutional framework which is considered to be conducive to the rapid growth, and achieving both the economic and social objectives.



Intven (2000) has also discussed many of the raised issues but more narrowly from the regulatory perspective. Melody and Mahan (2005; 2007) have discussed in detail (in their case studies prepared for WDR Research Cycles 2 & 3) the need for stimulating investments in network development, and the need for diversifying participation in network development efforts respectively; in order to bridge the existing ‘digital divide’ issue (esp. in the developing countries) and to successfully meet the USO (Universal Service Obligations) objectives. Finally, Samarajiva and Zainudeen (2008) from LIRNEAsia group also focus on the current policy and regulatory roadblocks in the development of ICT infrastructure in the emerging Asia (esp. in context of the fast developing South Asian countries), which currently experience rapid demand and growth particularly within the ICT sector, but they also inherit the institutional barricades (i.e. the policy and regulatory roadblocks) in their way to creating value from the ‘bottom of the pyramid’. This segment of the society actually makes the largest part of the consumer market, which has been reportedly neglected so far, and hence they suffer both the access and affordability related issues.

### **3.5 The Econometric Modeling & Technological Forecasting Perspective**

A wide stream of literature on diffusion analysis has strictly followed the statistical and mathematical modeling methods for their diffusion analysis. For example, the papers by (Gamboa & Otero, 2009), (Niculescu & Whang, 2010), (Puumalainen et al., 2006), (Cuberes et al., 2008), (Lee, 2007), and (Sheikh & Tsuji, 2010) have used different econometric modeling schemes and forecasting approaches such as the linear and nonlinear regression analysis, time-series models, S-shaped growth curves e.g. logistic-curve and Gompertz-curve, co-diffusion model, neural-networks model, and Bass diffusion model. The approaches used by these papers are quite mathematical. However, as arguably insisting the fact that diffusion is essentially a social phenomenon dealing with the understanding of the complex human behavior through social communication and physical interactions; adopting such a mathematical approach towards diffusion analysis seems like attempting to understand a machine behavior and its expected performance that has been pre-programmed, and hence expecting it to behave predictably as per the designed algorithms of the adopted mathematical models. However, when the researcher is out in the field to observe the actual patterns of the diffusion process in the real world ‘out of the lab’ space, then it appears quite a different story that is unlikely and probably impossible to be sufficiently defined or fully grasped by any scale of complex pre-defined algorithms or mathematical models, even if it is run on a high power processing machine. Hence, this thesis rather prefers that the diffusion researchers should personally go to the diffusion ‘space’ where the diffusion actually takes place, in order to dig out the reality out in the field through human interactions; assuming that the diffusion is a social phenomenon shaped in the actual field that cannot be simply predefined or predetermined through such mathematical algorithms, in isolation, while being out of the field and unaware of the actual scale of socio-economic complexities as arguably involved in the diffusion process.

However, there is another stream of literature (Wheatley, 1999; Gruber, 2005; and Esmailzadeh, 2006) that has a significantly broader scope and research agenda; although listed within this particular school of thought, due to their primary focus on using the econometric modeling approach in order to identify the determinants of the diffusion of telecom services. This stream of

literature is more focused on economic and technological dimensions of the diffusion of telecommunications services (than merely conducting the statistical analysis as discussed in the above case). Wheatley (1999) discusses the market and cost structure of the telecom markets both from the supply and demand side perspectives; however the book also discusses issues related to the telecom policy and regulations, provision of ‘universal service’, telecom diversification into less developed countries, and the strategic issues for the telecom suppliers and operators. Gruber (2005) focuses on the economic issues related to the supply of mobile communication services such as the stylized features of mobile industry, market conduct and pricing issues, spectrum management issues, and the perceived structural evolution of the mobile telecommunications markets. Esmailzadeh (2006) provides an interesting account on the relative cost-benefit analysis for the different mobile and broadband wireless services, including both the operational costs and the cost of networks and equipments. He presents a good mix of both economic and technical perspectives in his discussions, and concludes the debate with projecting some possible scenarios and future trajectories for the possible technological evolution and deployments.

### 3.6 The Strategic, Technical & Business Modeling Perspective

This stream of literature focuses on the strategic and technical dimensions of the product marketing for its successful diffusion; both by using the traditional business modeling approach, and also by evaluating the competing and alternative technological solutions for the creation of a successful telecom business in an ever changing technological landscape. Strouse (2001) maps out the telecommunications services’ market as drawn below, which illustrates the three key players namely: the access providers; transport providers; and the services, software and content providers.

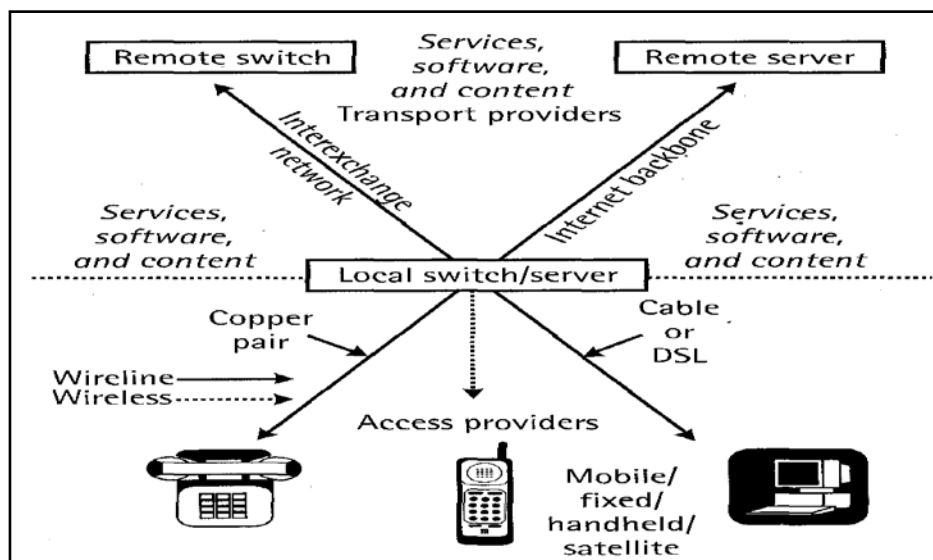


Fig. 11: Map of the telecommunications services market

Source: Strouse (2001)

After the deregulations and following the other changes as experienced over the years in the business landscape due to an ongoing telecom reform process across the world; the suppliers face the strategic challenge of differentiating their products from becoming market commodity, in order

to avoid falling into an undesired ‘price war’ and consequently an excessive ‘churn rate’. Hence, she proposes business modeling tools for the successful business creation in this changing telecom services’ marketplace by discussing a range of competitive and strategic approaches.

Olsson (2004) also discusses the building of a successful telecom business in the changing telecom landscape; however his approach is more technical-oriented as compared to the traditional strategic business approach. Weiss (2006) explores the emerging business opportunities available for the people outside the mobile industry to get financially benefit from this rapidly evolving industry by strategically exploiting the mobile ‘niche’ segments as MVNOs, particularly within the mobile contents and applications’ development business, which is still considered to be a highly unsaturated segment in most of the mobile markets across the world. He thus proposes different viable business models for MVNOs to fully explore many of these yet untapped mobile markets. Chlamtac, et al. (2005) discuss the need for all remote communities to have a ubiquitous access to the internet (broadband) services in order to prevent the deepening ‘digital divide’ within those communities. However; this study is more focused on the technical, regulatory and economic dimensions of access provision; and hence accordingly the overall orientation of their proposed business models and access technologies for the ‘community networks’ are mainly driven by the supply-side economies of scale.

Heillessen and Jensen (2007) emphasize on adopting the user-centered approach when strategizing for designing and implementing the Computer-Mediated Communications (CMC) applications. They discuss the challenges faced by the organizational settings where CMC and networked communications are increasingly being deployed without properly understanding or involving the users in a participatory mode during the whole process of solution designing, development, implementation and the subsequent use. It has been argued that ignoring the central role of users in the development and implementation of computer-mediated solutions leads to ‘technology-centered’ solutions resulting in a further complexity in the system, and users’ frustration and dissatisfaction with the newly implemented systems. It has been further argued that the ‘production-technology’ conceptions have less relevance with the human communication practices while taking support of CMC systems, in terms of the usage pattern and the produced outputs. Hence, those organizations which attempt to strategize for designing and implementing CMC applications without taking into considerations these fundamental differences may be caught up by surprises and serious problems. So it has been debated that the successful designing, integration, and adaptation of networked communications must involve users and other relevant human actors at all stages of the development process.

### **3.7 Managing Complexity and Integrating Change Perspective**

Rosenberg (1994) in his insightful discussion explains about the generation of technological change in reference to the processes by which the improved technologies are induced into economic activities. He argues that the technological change is a far more complex process than it is often thought to be, largely because much of the reasoning and modeling of technological change hopelessly oversimplifies its component parts. The process of technological change takes a wide

variety of forms so that the propositions that might for instance be well suitable for one specific case or applicable to one industrial sector may prove to be totally irrelevant to other sectors. The central idea is that the technological changes are mostly 'path dependent' in the sense that the future technological trajectories and forecasting depends on the historical events and the past patterns of development; hence he argues that the historical context matters a lot in managing technological developments, not only from the supplier's strategic perspective but more importantly from the policy-making and regulatory perspective. Being specific to the telecom industry, Rosenberg (1994) explains that the sector is currently experiencing a rapid and far-reaching technological change. Hence, he insists that a proper understanding of the forces that essentially shape the rate and direction of this change is mandatory for the policy-making and regulatory authorities in order to correctly predict and manage the upcoming technological changes and their wide ranging impacts. He further argues that even if it was possible to make authoritative predictions about the future path of technological change, which is not the case, the question about correctly assessing the ultimate social and economic impacts of those changes would have been entirely another matter.

From the policy perspective, Rosenberg (1994) argues that an understanding of the broad properties of technological change in telecommunications serve as a useful tool to reassess the rationale of adapted policies and the cooperative alignment with the private firms. It is debated that the telecom policies are often heavily focused towards weighing the tradeoffs between currently available technologies under alternative regimes. It is said that unusually complex analysis is necessary merely to predict a possible range of the outcomes that might emerge in result of a policy decision. The policy should be constructed to ensure that the technological path is as flexible as possible, that resources are channeled towards those institutions which consistently provide larger 'social benefits'. On the regulatory side, he adds on that the regulator should not pretend to be able to exactly predict the future level of 'systemness' or the viability of a specific technology. Hence in a complex and continuously changing telecom industry, the regulator should not be over confident in its sole ability to manage the technological change; and thus the regulator should also guard against the tendency to hop onto any particular technology.

Tidd, et al. (2001) argue that management of innovation is inherently difficult and risky since most of the new technologies fail to be translated into products and services, and accordingly most of the new products and services are not essentially considered to be a commercial success. In short, innovation can enhance competitiveness, but it requires a different set of skills from those of everyday business administration. The management of innovation has been considered inherently an interdisciplinary and multifunctional practice, hence it demands integrating and adapting with the technological, market and organizational changes simultaneously in order to improve the firm's competitiveness and organizational effectiveness. Dalum et al. (2002) discuss the importance of 'disruptive technologies' and the resulting emergence of new industrial clusters; and subsequently new opportunities for the further development of the existing ones. The term 'disruptive' refers to such significant changes in the basic technologies that may potentially change the industrial landscape, even if in the short-run.

Dalum et al. (2002) illustrate the technological life cycles of mobile communications in the following figures 12 & 13. In the first figure, an ‘envelope curve’ (similar to the S-shaped diffusion curve) has been drawn to illustrate the ‘life cycle’ pattern of the mobile industry. The path of these cycles is of course not as predictable as the diagram may indicate. The life cycle of an established technology may be prolonged by sustaining innovations or may be disrupted by the emergence of a new technology. ‘Sustaining innovations’ are not necessarily ‘incremental’, but they can be also quite ‘radical’ in nature. A ‘disruptive technology’, however creates a new technological life cycle. They further explain that initially the disruptive technology is often unable to immediately replace the established technology; however it creates a niche market targeting new set of applications for a targeted segment of society, and hence accordingly different scale of benefits for that segmented group of users. Over the time, its performance improves and in result the relative appeal to a larger pool of customers also rapidly enhances. The figures show that how the disruptive technologies initially exhibit relatively a lower performance than of the established ones. For some time, the established technology may continue to perform better and the disrupter may not be seen as a potential threat. But, because the disrupter has a different improvement trajectory, it will eventually outperform the older technology, although the latter may fight back by sustaining innovations, as shown in the figure.

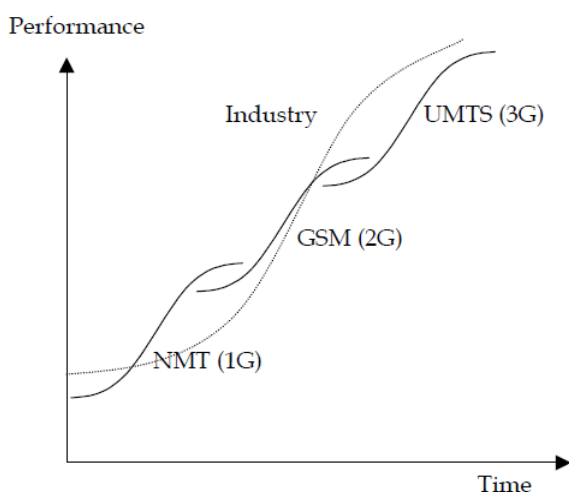


Fig.12

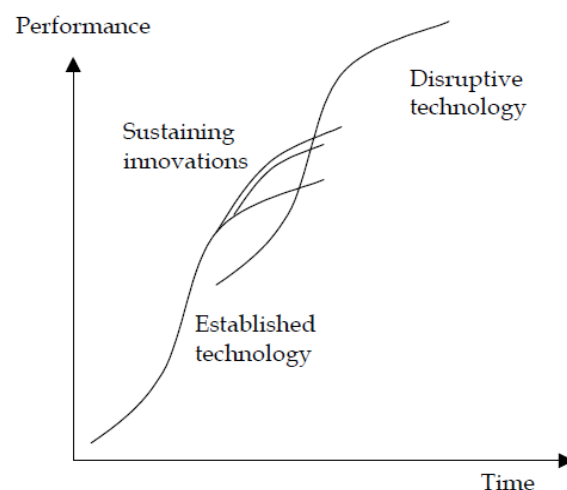


Fig.13

Fig.12: The technological life cycles of the mobile communication industry

Fig.13: S-curves for the established and disruptive technology

Source: Dalum et al. (2002)

### 3.8 The Social Construction of Technology & Actor-Networks' Perspective

The approaches of ‘Social Construction of Technology’/SCOT (Bijker, et al., 1987) and the ‘Social Shaping of Technology’/SST (Bijker and Law, 1992) emphasize on the interdisciplinary nature of technology development (construction of artifacts) and its subsequent implementation (the diffusion and use within society), which are assumed to be shaped by a ‘seamless web’ of relations and interactions between multiple actors from the social, political, economic and technological domains. These approaches don’t take the given technologies (or technological systems) as taken for granted;

just like the social, political and economic systems and their respective implications are not being accepted without due debates and arguments about their rationale. It has been debated that the lack of curiosity on behalf of society or the ‘users of technology’ may result in severe social and economic losses which become obvious later at a stage when faced with an unexpected technological outcome in terms of either unintended or misuse of technology or in result of a catastrophic technological failure.

These approaches reject the element of ‘technological determinism’ (commonly known as ‘technology-push approach’) and decline any scientific attempt of being rigid, categorized or linear when looking for the scientific and technological solutions. Hence, these approaches highlight the fact that ‘we get the technologies we deserve’, as the technological outcome reflects the scale of societal (or the user) participation in the shaping and construction of technology. So, the current shape and status of our technologies and societies actually mirror both the technological and social realities of the consuming societies, since the societies are not only shaping the technologies but they are themselves simultaneously being shaped by the adopted technologies through the specific patterns of technological usage in the society. This is considered to be especially true when the technological systems are indigenously developed, and not just being ‘imported’ as exogenous technologies without having considered the local context of their subsequent usage and implementation. In reality, these technologies are continuously being reproduced and shaped by the complex interplay of social, economic, political and technical factors. The final shape of technology appears to be a ‘closure’ which is achieved in result of a complex set of compromises and trade-offs between the involved actors after an ongoing negotiation and consensus-building process. The theories explain that the enthusiastic problem solvers, dedicated system builders and visionary entrepreneurs and innovators (like Thomas Edison) show no respect to the disciplinary knowledge boundaries. So, instead of following a specific disciplinary guideline, they rather explore the whole range of clues and possibilities wherever the problem-solving thread might have led them.

The Actor-Network Theory (ANT) has been evolved from the work of Callon (1986) and Latour (1987). An actor-network has been called essentially composed of both the human and non-human actors (such as a text, policy document, regulation or a technological artifact); and also the links that connect them together. ANT focuses on the translation processes and the interest alignment schemes, which these heterogeneous competing networks deploy in order to achieve their specific political and economic interests through promoting their own programs and agenda for the technological and social development. Hence, ANT simultaneously looks both at the social and technological elements the way they shape each other by engaging both the human and non-human actors within their envisioned actor-networks.

According to Walsham (1997), actor-network theory is not a stable and unified body of knowledge, and its developers and other researchers frequently revise or extend elements of this theory. Latour, B. (1999, p.15) himself mentions that “there are four things that do not work with actor-network theory; the word actor, the word network, the word theory, and the hyphen! Four nails in the coffin.” However, later in his writings (Latour, 2005 p.9), he reverses himself by saying that “I have

to apologize for taking the exact opposite position here as the one taken in Latour (1999); Whereas at that time I criticized all the elements of this horrendous expression, including the hyphen, I will now defend all of them, including the hyphen!" By making extensive use of interview scripts (e.g. Latour, 1996) and revealing the inscriptions within texts and technological artifacts, ANT attempts to understand and unravel the in-built actor-networks which are often found competing with each other through their deployed 'translation' processes. Hence ANT is also sometimes called as 'Sociology of Translation'. In ANT 'Inscription' is known as the process of creating technical artifacts (e.g. devices, networks etc.) and texts (e.g. laws, regulations etc.) as non-human allies to ensure and protect the leading actor's specific interest. The leading actors who control the 'Obligatory Passage Points' (OPP) are called as 'focal actors' since they have control of those 'gates' through which every other actor or 'mediator' (a supporting actor) has to pass through in order to achieve their respective interests and objectives.

As discussed in the previous chapter, the translation process is explained here further in detail in order to shed light on the scale of complexity involved in this subject. The 'translation' process is composed of four stages or called the 'moments of translations'. In the first stage, the 'innovator' or the focal actor attempts to create a forum, a communication channel (or a social network) in which all the actors agree that the network is worth building and defending. In this first moment of translation known as the 'problematization' phase, the focal actor highlights a problem and defines it in a way to make him/her indispensable in the new formation. He/she formulates and articulates the problem in such a way to ensure that his/her specific interests and objectives are well protected by the adopted framework. In the second moment of translation called 'Interessement', the focal actor strategizes or formulates a strategy in an attempt to bring the others' interests in line with its own interest to further consolidate and reinforce the strength of the ties (the connected links) of the emerging actor-network. In the third moment of translation, those whose interests are found in line (aligned) are then finally enrolled into the envisioned network and are assigned specific roles and positions by the focal actor accordingly; and on the other hand the others whose interests couldn't be brought in line are eventually discarded out of the network by dissociating or weakening their connections and links with the newly enrolled elements (actors) of the emerging actor-network. In the final stage of translation, the enrolled allies are effectively 'mobilized' through an efficient deployment of resources and an optimal use of the allied forces (the network elements) in order to realize the goals and objectives initially set for the formation of this particular actor-network. Hence, with the passage of time the turbulence settles down and the new actor-network gradually gets stabilize. But this is only the beginning of the story, since there are counter translations being advanced or promoted at the same time by the competing networks; and hence those actor-networks whose 'power of translation' supersede eventually control the market.

The ANT approach has been frequently quoted by the ANT theorists for the diffusion analysis of different technological innovations, including the telecommunications standardization and services; such as in case of Akrich, et al. (2002a; 2002b); Gao (2007); Lyytinen and Damsgaard (1997); Gao and Damsgaard (2007). Akrich, et al. (2002a; 2002b) debate about the key issues associated with the successful diffusion of technological innovations, while highlighting the art of 'interessement'

and the key role played by the ‘spokesperson’ respectively. They criticize the naïve approach of the ‘technology-obsessed’ engineers, when they ignore the critical importance of the contextual understanding of the diffusion cases, and accordingly the significance of the relevant ‘translations’ that take place during the diffusion processes. They criticize those engineers for being overwhelmingly obsessed within the technical details and ignoring other important dimensions, which have been considered key to the successful diffusion of innovations.

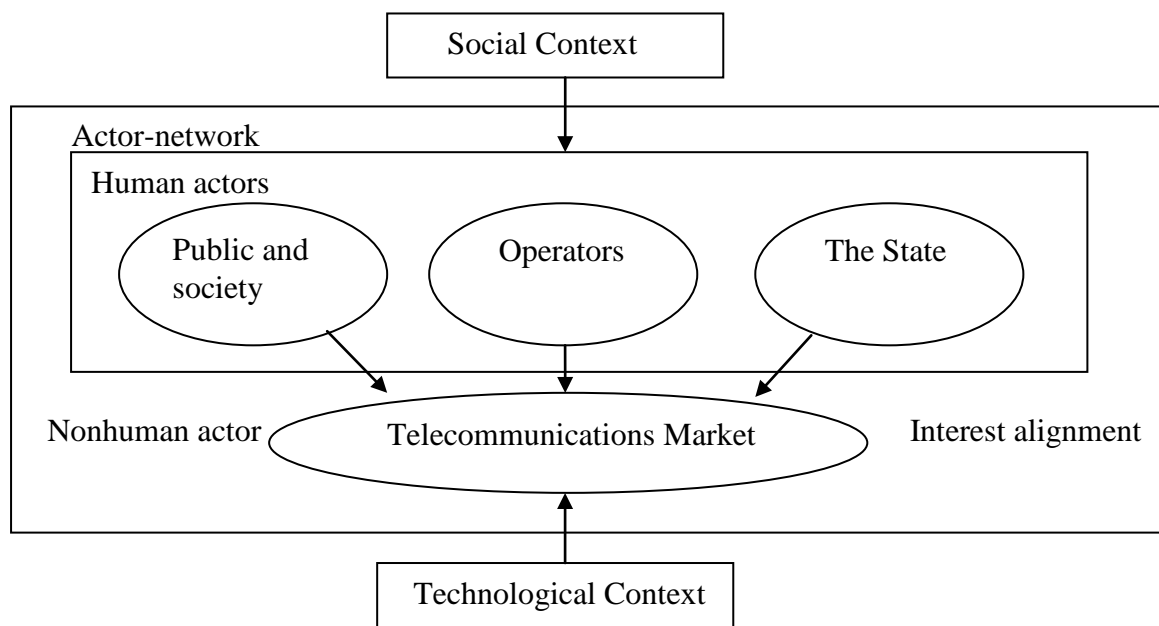


Fig.14: Framework of the actor-network analysis of telecommunications services industry  
Source: Gao (2007)

Finally, in the above figure, Gao (2007) advances a theoretical framework for the actor-network analysis of the innovations within the telecommunications markets. He defines public, state and operators as three groups of human actors that represent the social interests of different groups in the telecommunications market during the shaping of these markets. He further explains that the relationships between the human and non-human actors exemplify the ongoing struggle (tension) during the strategic formulations and technological transformation. He argues that with time, as the contextual elements will vary and the interests of both human & nonhuman actors and their respective alignments alter, it may result in changes to the approaches of market transformation.

### *Preparing for the Case Study*

The aim for the previous three chapters i.e. the introduction, research methodology and literature review was to provide a solid foundation and basic understanding to deal with the complexity of the issue in hand; in order to design the required theoretical framework for conducting the empirical study. The forthcoming seven chapters (chapter 4-10) of the case study make up the main part of the thesis which would shed light on the key issues and the initially raised four major research questions what this thesis basically aims at investigating.



# Case Study

## Chapter 4

### Case Study – An Introductory Overview

This brief chapter serves as an introduction to the building blocks of this case study. The chapter sheds light on the methodological aspects related to the current inquiry. It also discusses the main actors that essentially compose the foundational map of the telecom service's market in Pakistan, and who have been also actively engaged during the case study.

#### 4.1 The Aim of the Case Study in a Nutshell

The main body of the case study is composed of six chapters (i.e. chapter 5-10), which clearly have a logical relationship with each other in terms of how the different topics and issues have been developed and accordingly discussed. This is in line with the logical flow of the 'report structure' that was initially outlined in chapter 1 (see figure 2). This case study primarily aims at digging out and unearthing the realities out of the grounded facts through engaging maximum number of relevant actors; in order to collect their insights and views from different vantage points on the various issues related to the diffusion of telecom services within the local context. The repetitive engagement of the relevant actors aims at properly understanding the competing translations and the respective roles of different actors in the shaping of telecom markets. The author here attempts to disclose the 'constructed realities' by exploring the 'undistorted facts' with the help of an impartial analysis of the competing translations; in order to comprehensively shed light on the major reasons laying behind the relative success and failure of the compared telecom services in their diffusion process. It has been attempted to include the voices and concerns of the representatives of all domains on the relevant issues; so that to facilitate their counterparts in effectively understanding the market dynamics through being fully exposed to the social, political and economic shaping of the sector within a multi-actor environment. This deliberate attempt of opening the technological 'black box' by continuously engaging the concerned and interested parties within a social communication process, is expected to result in a better exposure to the real complexities involved in the diffusion of telecom services in a complex socio-economic context.

#### 4.2 Data Sources

The following six chapters will make up the main body of this thesis, which is based on the detailed analysis of the collected empirical data. The primary sources of information used for the collection of data are composed of the: detailed interviews with 54 representatives that essentially belong to different domains; and a detailed questionnaire (see Appendix 1) which was responded by 355 telecom end-users during the 6 workshops as they were conducted in different universities across the country, during the period 2009-10. The author also extensively made use of the personal observations, documented and online sources, and informal talks with a range of people. In addition to that; one workshop was held in the telecom regulator's premises where the representatives of the supplier domain were present. Please refer to the following tables to have an overview of the list of institutions which were engaged for arranging those workshops, and whom representatives were interviewed during the case study. The data from the secondary sources of information has been also frequently referred, whenever required.

## Workshops

Number of Workshops: 7

Duration: 90 minutes – 30 minutes Presentation, followed by 60 minutes of filling Questionnaires

Audience: Above 500 (in total)

Number of Correctly filled and returned questionnaires: 355 (return rate - above 70%)

Name of the Institutions
Pakistan Telecommunications Authority - participated by the representatives of ‘Supplier Domain’
University of Balochistan (UOB)
Balochistan University of Information Technology, Engineering and Management Sciences (BUIITEMS)
Tameer-e-Nau Public College Quetta (TNPC)
International Islamic University Islamabad (IIUI)
National University of Science and Technology (NUST)
University of Gujrat (UOG)

Table 3: Name of the institutions where the Seminars/Workshops were held

## Interviews

Number of Interviews: 54

Duration: (in average): 60 minutes

Supplier Domain*	Policy, Regulatory, Supporting & User Domains*
PTCL (Fixed line and Internet Incumbent)	PTA (Sector-specific Regulator)
Mobilink (Mobile Incumbent)	CCP (Competition Regulator)
Telenor (Mobile Network Operator)	MoIT-Telecom Division (The Ministry)
Ufone (Mobile Network Operator)	Senior Bureaucracy (Education & Works)
Warid (Mobile Network Operator)	FBR (Federal Board of Revenue)
Zong (Mobile Network Operator)	PTV (Electronic Media)
Wateen (LL, LDI & Broadband Operator)**	Radio Pakistan (Electronic Media)
Wi-Tribe (LL, LDI & Broadband Operator)	BUIITEMS (University)
Link Direct (LL, LDI & Broadband Operator)	IIUI (University)
Cisco (Vendor)	Degree college Quetta (College)
Microsoft (Vendor)	UOB (University)
ISPAK (Representative Forum of all ISPs)	UOG (University)

Table 4: Name of the institutions whose key representatives were interviewed

\*The individual names of the interviewees are kept confidential here as per their request.

\*\* LL and LDI stand for ‘local loop’ and ‘long distance international’ respectively

### 4.3 Mapping the Telecom Services' Market

Based on the theoretical insights and empirical study, the author draws here a foundational map of the telecom services market (fig. 15) that sheds light on the respective positions and patterns of interaction between the major actors of the market. However, due to the general nature of the mentioned actors and their specified roles; the map may potentially serve as a point of departure in a general context with a universal validity. The telecom services' market is fundamentally composed of a range of actors within the five major domains. For the illustrative convenience, the policy and regulatory domains have been merged here in the map; however, for all the practical reasons, they should be considered as two separate domains. The map presents the policy and the regulatory domains together also due to the fact that the regulatory domain remains tightly coupled with the policy domain in exercising its mandate and undertaking the respective operations; and hence the regulatory operations can be essentially considered as a logical continuation of the policy domain's activities due to its presumed role of working as an 'instrument' in the effective and efficient implementation of the delivered policies. The highlighted actors within these different domains are supposed to be interacting with each other within and across their functional boundaries in shaping the telecom services' market; hence it refers to the presence of a high degree of inter-dependence between the actors and their associated domains. In the map, the direction of arrows indicates the perceived patterns of interactions between these actors during their exchange of transactions, legal provisions, requested information, equipments and expertise with the help of both formally & informally established communication links/channels.

It is important to mention here that the map only serves as a foundational structure which cannot fully elaborate the real complexity of an actual actor-network map that involves the whole range of actors, including the actors of the (unmentioned) fifth domain named as the 'supporting domain'. Even among the mentioned actors, there could have been other possible communication and transactional links between those actors. For example, the users may interact directly with the telecom vendors, content providers, competition commission, regulator, and the policy unit through bypassing the operators and service providers. Hence; this map should be only considered as a foundational structure and a point of departure to understand the inherent complexity of the market composition and its dynamics. The map highlights four 'focal actors' (named with the bold letters). 'Focal actor' is a term coined by the Actor-network (ANT) theorists to denote the central element of a network that predominantly controls the 'translations' and 'interest alignment' processes during the development of an innovation, its deployment and the subsequent diffusion process. Hence, the focal actor holds a very significant and strategic position in the bargaining and dialogue process, which enables and authorizes it to potentially influence and control its surrounded setup whether it is a political, social, economic or a technical one; in a quite complex set of overlapping interactions without differentiating between the macro and micro levels. To elaborate it further, ANT uses the phrase of 'Obligatory Passage Point' (OPP) which refers to a significant passage point or a sort of an imaginary 'gate' through which everyone else has to pass through in order to achieve its targeted objectives associated with a specific innovation. The focal actor renders itself as an 'indispensable' element in the innovation and its diffusion process through strengthening its control over the OPP.

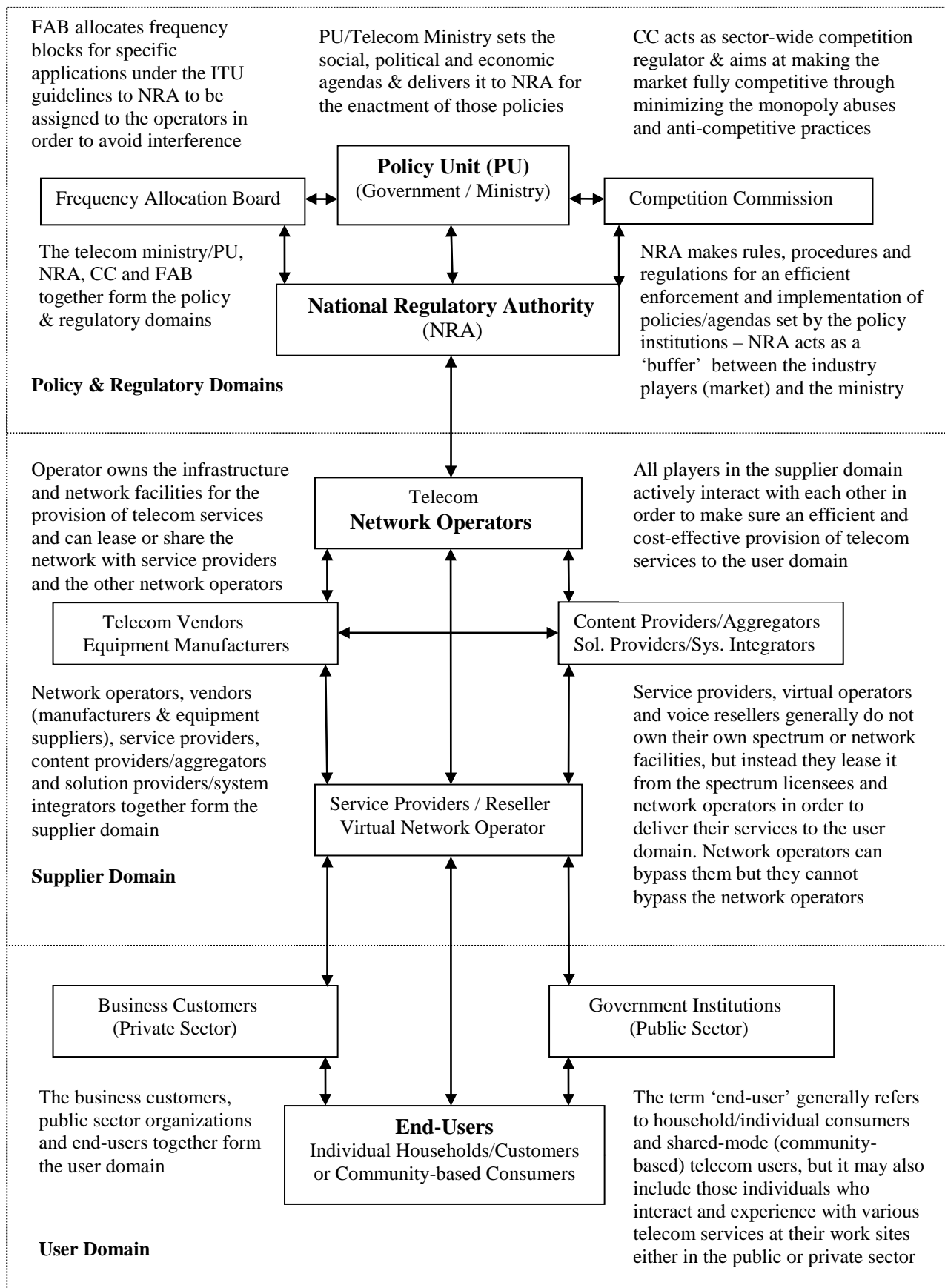


Fig. 15: A foundational map of telecom services' market (Source: Author)

The composition of focal actors, their respective roles and the patterns of interactions may shift and considerably vary within the different socio-economic contexts, depending on the balance of power (power distribution structure) in each society. The regulatory authority defines rules of the game for a smooth implementation and enforcement of delivered policies, in light of the underlying social, economic and political agendas set by the policy unit. The regulator plays this mediating or 'buffering' task between the user, supplier and policy domains by assuming a complex set of roles for itself, depending upon the current status of market competition. The regulator may possibly act like an 'observer', 'controller' or as 'facilitator'. For example, in an authoritarian society, the role of regulator is expected to be quite dominant, in an attempt to tightly control the market through an extensive use of the regulatory instruments and regular interventions even in day-to-day operational activities. Hence, in a 'policy and regulation-driven' telecom market, the policy maker and regulator essentially play the commanding role.

Secondly, the telecom network operators own and have control over the 'essential facilities' (i.e. the telecom network and basic infrastructure); without which the telecom services cannot be accessed or delivered to the end-users. Hence, the telecom operators, particularly the incumbent operator, basically controls the most important part of the value chain in a 'supply-driven' telecom market, which is essentially led by the predominant rationale of 'technology-push' approach that primarily aims at achieving the 'supply-side economies of scale'. Thirdly, there comes the telecom users, whose eventual acceptance and approval is an obligatory requirement for achieving success in the diffusion of an innovation; and without which all the debates and initiatives are essentially considered to be meaningless. Hence, here it is the user that actually controls or plays the most significant role in the 'user-driven' telecom market; and in this case the dominant rationale remains the creation of 'demand-side economies of scale' for the successful diffusion of telecom services.

The successful diffusion of telecom services cannot be fully realized until the four key focal actors have effectively played their pivotal roles in building consensus on the major issues; through bringing some sort of strategic alignment in their respective vision, interests and actions. However, in this particular case, the focal actors are thought to be the regulatory authority (sector-specific regulator), telecom operators (suppliers) and the telecom ministry (policy unit); and in fact, the telecom 'users' are generally not considered among the list of focal actors. It is important to note that the role of users has been traditionally found much vocal and stronger in case of the 'egalitarian' societies. On the contrary, in case of Pakistan, the role of users has been observed relatively quite weaker in the shaping of telecom services' market, or their critical role has been often deliberately ignored due to the prevailing authoritarian nature of the society. On the other hand, here the roles of policy and regulatory domains have been conventionally remained as the dominant one, both over the supplier and user domains. However, a gradual shift could be expected in the future, as the markets would gradually get more liberalized and matured over the time, and the users would also get further informed about their basic rights as being telecom consumers. Hence, it might be expected that eventually their voices would be properly heard and given the due attention by the other domains. Such a shift is already obvious in case of the cellular mobile market, which has been seen quite developed and liberalized over the past decade under the competitive

market conditions, as compared to the broadband and fixed line markets. In result, the voices of mobile users have been noticed relatively more vocal, when compared with other telecom services.

Finally, the term ‘Mediators’ refers to a range of other complementary and supplementary actors (both individuals and institutions) who can either facilitate or oppositely may retard the pace and the positive impacts of the diffusion of telecom services. For the successful diffusion of telecom services, a clear understanding of those focal actors and mediators in terms of their positions (locations in the map) and their assumed interactive patterns (mutual relationships) is deemed to be quite helpful. It is important to highlight here that apart from the actors of the four major domains as previously discussed, there are many other important actors and mediators who might also play quite a significant role in the diffusion process but they are not institutionally part of any of the above discussed four major domains. So, these relatively independent but influential actors are assumed to be making a fifth domain named here as the ‘supporting domain’, which is essentially composed of the financial institutions (banks, venture capital firms etc.), legal institutions (courts), labor unions, academic & research institutions (universities, research centers, consultancies etc.), bureaucracy, media (electronic and print media) & military institutions (defense forces and security agencies). The position of these supporting actors should be imagined as essentially surrounding the other domains in the drawn map (fig. 15); and hence, illustrated here in the following figure (fig. 16) for the readers’ convenience accordingly. These actors and mediators of the supporting domain are supposed to be frequently interacting with the actors of the other domains during the diffusion of telecom services.

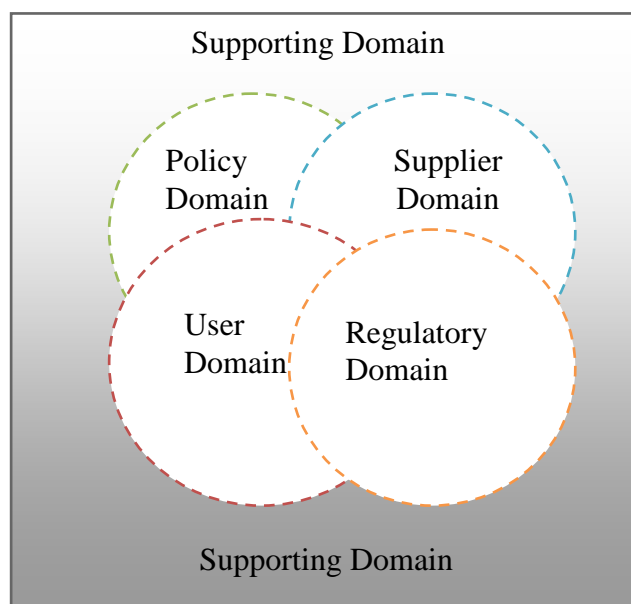


Fig. 16: The construction of ‘reality’ by the actors and mediators within the five interactive domains  
Source: Author

Hence, the author presumes here that without an active participation and supportive role of the whole range of actors belonging to the supporting domain, the successful diffusion of telecom

services would not be possible. Investigating a complete list of those actors and mediators would be probably beyond the scope of the current research; however, a preliminary list of the major actors and mediators are classified here within each described domain in the following table.

<b>Policy &amp; Regulatory Domains</b>	Regulator, Telecom/IT Ministry (Policy Unit), Competition Commission, Political Pressure groups, Frequency Allocation Board International Organizations (e.g. ITU/UN, IMF <sup>12</sup> /World Bank etc.)
<b>Supplier Domain</b>	Network Operators, Equipment Manufacturers/Vendors Service Providers, Content Providers (Aggregators), Solution Providers (System Integrators), Industrial Associations (Consortiums)
<b>User Domain</b>	Users, Consumer Groups (Associations, NGOs), Consumer Courts
<b>Supporting Domain</b>	Financial Institutions (e.g. Banks, Venture Capital Firms etc.), Legal Institutions (Civil Courts), Labor Unions, Bureaucracy, Academia, Research Centers & Consultancies, Media (Electronic and Print Media), Military Institutions (Security Forces and Law-Enforcement Agencies)

Table 5: The classification of focal actors and mediators of telecom services' market

Source: Author

#### 4.4 Some Methodological Discussions

The research methodology of this thesis has been already discussed in chapter 2; however some of the remaining points specific to this particular 'case study' have been briefly debated here in order to further shed light on three significant issues.

First, the author assumes its role in this whole debate not just like a 'distant observer', but more as an active participant of the debating community itself. By being part of the debate from onset, as an impartial and unbiased participant, it was expected that both the respondents and the readers would find the current debate as a lively, interactive and focused discussion. The author attempts to initiate and conclude the discussion whenever it has been deemed relevant and the right time for it. It is assumed here that if the author's part of the debate and his recommendations were kept in pending until end of the thesis, it might have caused the loss the continuity and the flow of discussion; and probably would have also required unnecessary repetition of the previous arguments. Hence, it has been strived hard to keep the momentum up, while portraying the image of the author in the respondents' and the readers' mindset as of an active participant; who is curious to dig out the reality from those spirited discourses and the grounded facts.

Secondly, the author also frequently refers to different online sources of information in order to find new clues and leads for the further research and discussions. It has been found that many new perspectives and vantage points have been opened up due to an extensive use of online news clips

<sup>12</sup> ITU, UN and IMF stand for International Telecommunications Union, United Nations and International Monetary Fund respectively



and research reports relevant to the development of telecom sector. The author has been investigating those online sources for several years as a routine practice, which resulted in a huge volume of data collection, which was required to be carefully sorted out. However, the author is also well-aware of the fact that the online sources are often not considered that credible and authentic sources of information to be used for the reference-making purposes, when compared with the published research available in form of the books and journal papers. To encounter this impression, it has been attempted to cross-verify a lead story or a provided statistical data from different other sources as well; in order to increase the reliability and authenticity of those given references. It seems imperative to also mention here an important fact that making an updated research account on the development of local telecom market, which is essentially considered to be a rapidly changing and fast shaping market; it is not sufficient to just relying on traditionally published research, since by the time a research is published in a journal or in a book, its presented data is often already considered to be outdated. Moreover, it is also not often possible in the practical conditions to reiterate the communications again and again with the primary sources of information by engaging them in dialogue, interviews or keep asking them filling out the questionnaires in order to get an updated account or statistics on the continuously new emerging issues. Hence, the author prefers a conscious and an effective use of the online resources and references; in order to be updated with the recent developments occurring on different fronts.

Thirdly, the author also acknowledges the fact after having conducted an in-depth inquiry on the available published sources of information on this particular case study, that there is apparently only a scant amount of thoroughly conducted research and data is available that actually goes in depth of discussions and arguments based on the genuine analysis at an academic level. On the contrary, most of the available data on this focused case has been found either referring to merely to an open-ended statistics without sufficient analysis, or are in-essence 'loose talks' without any support of sufficiently conducted reliable research and convincing discussions that is essentially required to effectively deal with the involved scale of complexities. Hence, the author often takes the lead position in concluding the discussions, particularly in the absence of any available references from the literature or other published resources on the discussed issues within the context of this particular case study. It is important to remember that the recent developments within the telecom markets in Pakistan have been considered relatively quite a new phenomenon; and hence it is still considered to be quite a green area for further research and investigations; as compared to studying the development of telecom markets in case of the developed countries such as US or EU; where plenty of continuously updated publications are available to be frequently referred to, in order to generate an authentic and reliable account based on the established and well-recognized work of the past researchers.

#### 4.5 A Brief Outline of the Following Chapters

Finally, here a brief outline of the forthcoming chapters has been provided for the readers' convenience. Each chapter discusses the issues considered as relevant to that particular domain; in order to maintain the logical continuity of the discussed topics. Though it remains a challenging task to preclude the discussions or precisely delineate the boundaries between the different domains, since often the discussions overlap and encompass multiple actors belonging to different domains; hence making it quite difficult to decide exactly in which category a particular debate fits best. However, the author tries his level best to not force the data in any predefined category, and to let the categories emerge out of the data itself.

The author deliberately starts the debate by engaging the users at the first place in order to properly project their perspectives and concerns; and hence to let them lead the following discussions. By placing the users at the 'driving seat' in defining the topics and direction of the debate; is actually to emphasize the significance of a 'user-driven' innovation and diffusion process, what the current author particularly wants to highlight and focus upon, in order to bring the attention of other domains towards the critical role of the users in the technology diffusion. Hence, chapter 5 gets its respective position in the beginning of debate; in order to first put forth the users' perspectives on the raised research questions. The discussions of the user's domain have been analyzed using both the quantitative analysis of the data received from the questionnaires; and also by the qualitative and descriptive analysis of their commentary as received in form of either verbal communication (during the seminars, individual interviews and personal observations), or through the textual phrases (from the descriptive parts of the questionnaire). Therefore, the first part of this chapter is composed of the quantitative and graphical analysis; whereas the second half is primarily based on the qualitative analysis of the users' comments and recommendations. The chapter ends with a brief discussion about the role of local 'consumer groups' in the shaping of telecom market; in an attempt to evaluate their effectiveness in promoting the telecom users' concerns and protecting their rights.

However, the government and policy makers are also there to protect the consumers' interest; and accordingly to develop the different telecom markets to benefit the society in general. Hence, this domain should essentially provide the shield for the telecom users against any market abuses with the help of devising 'pro-consumer' policies. Chapter 6 discusses in detail a range of issues which are supposed to be addressed by the policy domain (as discussed in the literature and also presumed by the author). It includes the issues like understanding the different roles of policy domain, erecting the policy framework, licensing policy, telecom reform initiatives, impact analysis, digital divide, balancing between the foreign and local investments, grey trafficking, consensus building among the stakeholders on key issues, excessive taxes, broadband benchmarking, social and moral issues related to ICT usage, privacy concerns, and addressing the security issues and general law & order situation etc.

The regulator role in the diffusion process is to act like a 'buffer' between the policy domain and supplier domain; since it has to ensure the effective and efficient implementation and execution of the delivered policies. Chapter 7 discusses in detail the major issues considered as relevant to the

regulatory domain; in order to understand the effectiveness of the regulatory authority in addressing those issues. The chapter discusses the issues like the desired role of the regulator, establishing competition and curtailing the monopoly and anticompetitive practices, the cut-throat price competition and declining ARPU (average return per user), balancing the current tariffs and high ratio of ASR (approved settlement rates) and APC (access promotion contribution) respectively, accounting separation, interconnection arrangements, rights of way (RoW), infrastructure sharing, control over the essential facilities, price regulations, affordability and billing transparency, technology-neutrality, excessive licensing and inefficient entries, number portability & trading etc.

Chapter 8 discusses the role of telecom suppliers, primarily the network operators and service providers, while considering Pakistan as essentially a services' market. The chapter discusses the issues related to coverage and access provision, quality of service (QoS), changing market dynamics in result of the advent of WiMAX and WLL services, mapping teledensity, creating market awareness, content development, value-added services (VAS), future trajectories of different access technologies, international connectivity, innovation networks and business values etc. The next chapter (chapter 9) covers the topics deemed to be relevant with the fifth domain named here as 'supporting domain', that essentially includes all those actors who doesn't structurally belong to any one of the above mentioned domains; however they still play a significant role in the successful diffusion of telecom services, if they act in the desired way. The chapter concisely elaborates on the respective roles of media, financial institutions, civil courts, and military institutions.

Chapter 10 focuses at investigating the positive and negative impacts of ICT services, particularly from the users' perspective; but also looking at the societal level in general. The analysis effectively makes use of both the quantitative and qualitative data in order to comprehensively encompass a whole range of issues associated with the use of telecom services in the social, political, economic and educational context. The ICT impacts on the academia, bureaucracy and social life have been particularly focused in these discussions. Finally, chapter 11 summarizes the whole discussion by presenting an identified list of 47 major attributes and factors which are seemingly involved in case of the successful or unsuccessful diffusion of the compared telecom services in the specific context of Pakistan. This follows by a concise recap of those highlighted list of issues that might be used as a guiding framework for the strategic, policy and regulatory debates within the three respective domains i.e. the policy, regulatory and supplier domains. This last part of the discussion includes the developed inductive generalizations, as based on the previous discussions.

## Chapter 5

### The Analysis of 'User Domain' – Perspectives and Recommendations

This chapter is composed of an in-depth analysis of the inputs received from the users of the telecom services. These inputs were received by conducting a number of interviews, extensive observations and through a structured questionnaire filled by 355 respondents (primarily students of 6 different academic institutions located across the country). The sampling was done very carefully in order to get a better reflection and representation of the diverse socio-cultural and geo-economic conditions of the country. Hence, for the workshop sessions, three institutions were chosen from the most remote and least developed part of the country called the province of Baluchistan; whereas the other three institutions were chosen from the relatively developed part of the country i.e. the federal capital Islamabad and the Punjab province. Apart from the structured inputs received from the questionnaire on the Likert scale; there were also substantial amount of inputs received from the semi-structured (commentary) parts of the questionnaire, where the respondents were given the opportunity to openly debate the range of issues related to the diffusion of ICT services using their own perceptions and critical reflections. Following the questionnaires, a carefully selected sample of 15 well-informed users (mostly the university students of a graduate program in telecommunications management discipline) were interviewed in detail. Those dialogue sessions with the students were deliberately left relatively open and un-structured in order to collect their spontaneous and reflexive responses on the key burning issues.

The following sections of this chapter would shed light on the results of the data analysis derived from the questionnaires and user interviews, which would help understanding the current status of telecom users, their patterns of usage, and differential diffusion of the compared telecom services.

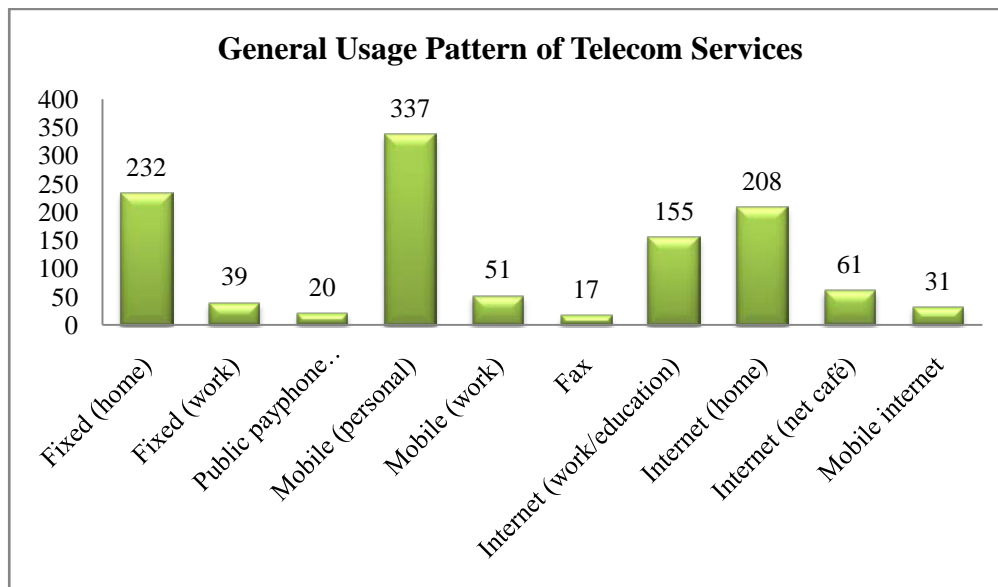
#### 5.1 The Service Preference and Usage Pattern

In this section, the users scored a range of different questions, basically aimed at investigating the service preference and the pattern of usage of different telecom services within different contexts. Based on data analysis, three different graphs are developed that deliver interesting information. The graph 1 gauges the relative use of the basic telecom services in a general term. It clearly reflects that the most common service used by 95% of the respondents is the mobile phone service (mostly used as a personal gadget). Followed by the mobile phone, the use of landline phone (home connection) is slightly higher than of the internet service. The median age of the survey respondents is 21 years; which has been also reported as the median age of the country<sup>13</sup> as well. However, despite this similarity; the survey results may not necessarily reflect the usage pattern of the overall population. Among the landline (home) users, only 16% users were also using the fixed line service at their work. This ratio is quite low as expected, since the students (the main respondents of this questionnaire) are not supposed to have an easy access to the fixed line connection in their academic campuses during the study hours; but the situation would have been quite different if the

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<sup>13</sup> <https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html> (Accessed on February 23rd, 2011)

survey had also included a significant number of working and business class people, as they frequently make use of the fixed line telephony at their work. Internet usage comes on the third place; however even here, most of the internet users use the internet service at home. Nevertheless it is important to explain here that it doesn't mean that the respondents were given the option to cross (or mark) only one of the boxes among the available list of choices; which clarifies that definitely the respondents may have crossed multiple boxes, if they were using all those services, say internet at home, at work, in net cafés or on their mobile phones respectively at different times and occasions.



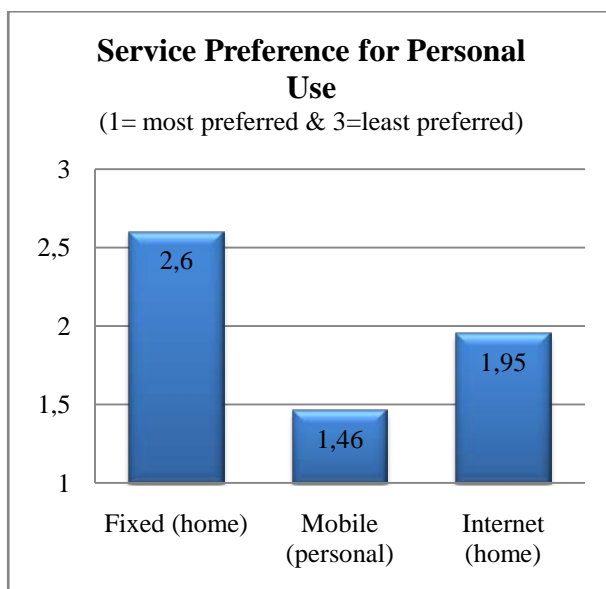
Graph 1: General Usage Pattern of Telecom Services

Source: Author

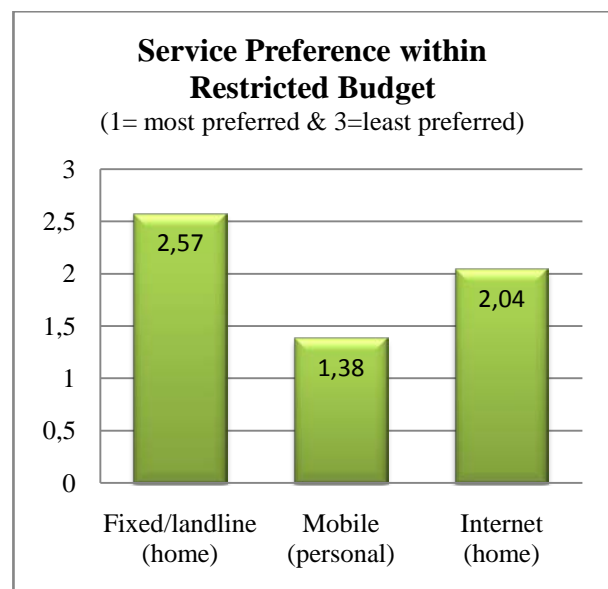
About 25% of the internet users at home don't use internet at their work places or in the educational institutions, which is quite a notable result. It reflects a relatively lower usage of internet within academic institutions; which could partially be attributed to the 'accessibility' issue i.e. lacking of the internet facility within these academic institutions; or it may also be referred to the 'requirement' related issue i.e. indicating the fact that the need for internet usage has been not yet acutely felt among the students (respondents) for the educational research and fulfilling of the academic requirements. Another interesting figure shows that only 17% of the total respondents use internet in the net-café (as shared-mode access), which shows the trend of decline of the shared-mode internet access over the time, reflecting that the internet access within the users' premises is now gradually increasing; which is quite a similar result as observed in case of the declining trend of the use of shared-mode public access payphones and the 'Public Call Offices' (PCOs) due to the increased use of personal mobile phone service. Hence, a common trend reflects a gradual transition from the shared-mode access towards the 'service personalization' and an increased desire for the 'user-control over its communication needs'. Some telecom services such as Faxing (Fax) and public payphones have been ranked among the least used services, not because of the affordability issue, but due to being considered as outdated telecom services among many respondents. Fax is

seen increasingly being replaced by the scanning facility while sending the scanned file as an email attachment; whereas the public payphones service is becoming obsolete due to the arrival and mass scale diffusion of the mobile phone service, even in the rural areas as well.

The following two graphs refer to the service preferences made by the users among different telecom services for their personal use and within the restricted budget respectively. The scaling correctly measures their level of preference for each service and also their level of felt need to subscribe for a particular service in a specific context. The first graph illustrates that most of the users prefer mobile service to be subscribed for the personal use at the first place, followed by the internet service and lastly the fixed line service at home; even though if the users also have access to these facilities at their work places. The second graph illustrates that within the restricted budget, if the user had only one choice to subscribe for a service, then again the user would have given utmost value to mobile service to be subscribed for at the first place, followed by internet and then lastly to the fixed line service. The trend of budget-restricted choices is obviously very similar to the ‘service-personalization’ related choices, when compared among the three telecom services.



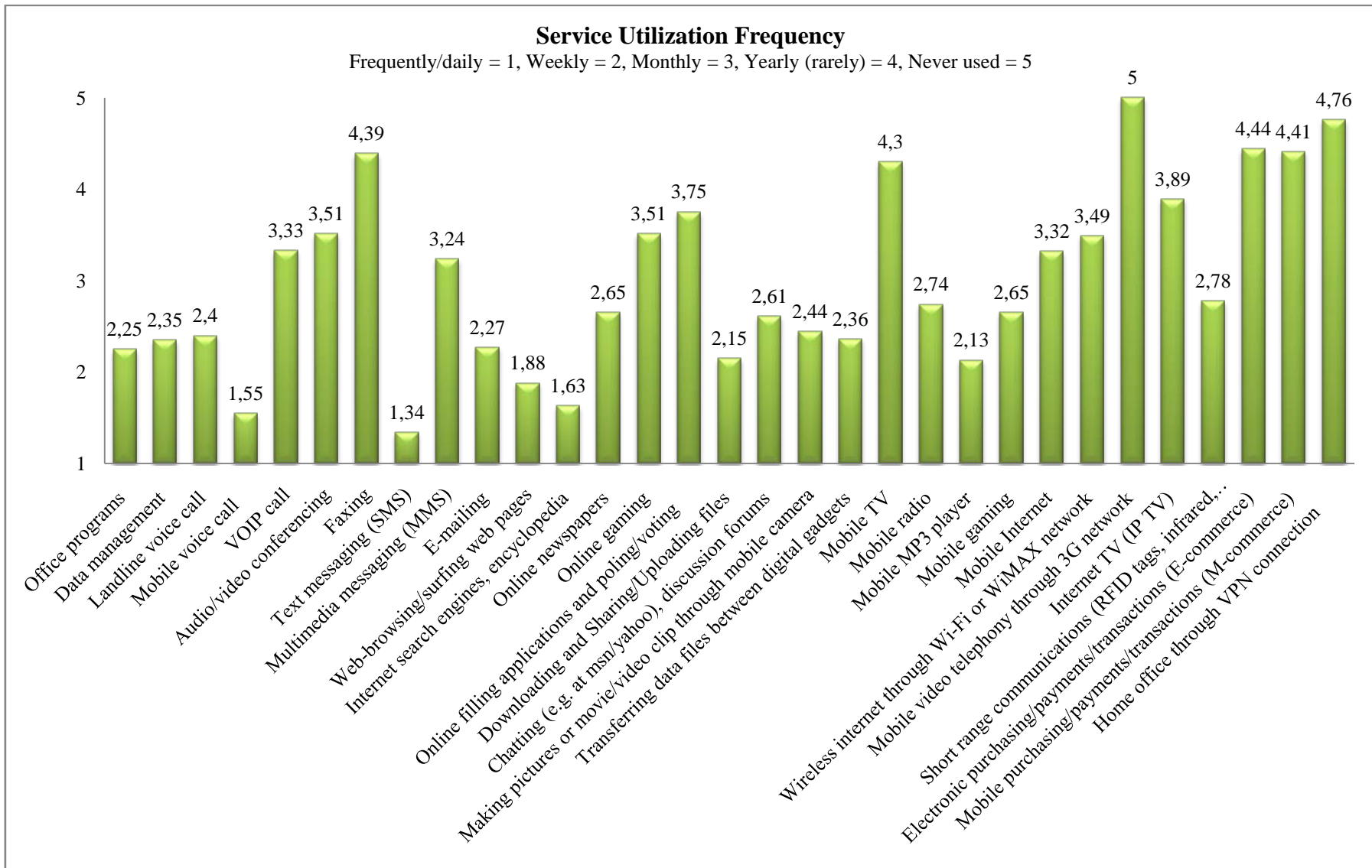
Graph 2: Service Preference for Personal Use  
Source: Author



Graph 3: Service Preference within Restricted Budget  
Source: Author

## 5.2 Frequency of Utilization of Telecom Services

The users were asked to score a list of 31 different ICT services and applications in order to find the frequency of utilization of those listed applications. Some of those listed services and applications were either not yet available in the country (or not accessible in a specific location) or were not in use of a common man due to the lack of technological awareness and service irrelevance. Those yet unavailable or rarely used list of services and applications include: 3G mobile service, VoIP (Voice over IP), mobile commerce (m-commerce), internet/electronic commerce (e-commerce), VPN (Virtual Private Network), RFID tags (Radio Frequency Identification), and IP-TV (est. 2010).



Graph 4: Service Utilization Frequency (Source: Author)

There were other services which were available but at a price that has not been commonly considered as affordable for the general masses; such as mobile TV, mobile internet, and broadband wireless technologies i.e. WiMAX & EVO<sup>14</sup>. Hence, the restricted usage of above mentioned services can be seen from the graph 4, keeping in mind that the data has been accumulated mainly from the university students who are supposed to be among the smart users (i.e. the ‘innovators’ and ‘early adopters’ within the adopters’ categories) of telecom services. However, in addition to the listed ICT applications; the users suggested for adding two more applications in this list namely the ‘internet radio’ and the ‘Social networking communities’ (such as the popular pages of Face Book, Twitter, LinkedIn and My Space etc.).

From the responses of graph 4, it can be seen that the ‘text messaging’ (SMS) service has been rated among the highest in terms of its utilization frequency; even higher than the mobile voice calls (which is ranked as the 2nd most frequently used service). Remember the fact that this only reflects the usage trend among the student’s community, whereas the general masses in Pakistan still predominantly use the mobile voice call service as the major means of their communication (most likely due to the lack of technological awareness and higher illiteracy). The fact is also revealed by the operators’ provided data that their major streams of revenue still come from the voice services; whereas the contribution of VAS (‘value-added services’ including all data services such as SMS, MMS<sup>15</sup> and mobile internet) in the total generated revenues only remains less than 10% (est. 2010). The service utilization frequency of other services and applications can be observed from the graph.

### **5.3 The Average Return per User (ARPU)**

From the perspective of the monthly spending on different telecom services, the trend seems to be quite reversed; since in this case the fixed line users appear to be spending the most, which is almost double of their personal mobile phone monthly billing. That may be for the apparent reason that mobile is used as a personal gadget; whereas the landline connection at home is used as a shared mode communication access for all the family members. The internet users’ monthly spending comes on the second place; whereas the users’ spending for the mobile phone usage has been noticed the least among the compared services. Apart from the shared or personal mode explanations regarding the ARPU, another explanation for these patterns could be the charged service fee itself. As a matter of fact, that mobile phone service is currently offering the most competitive rates as compared to other telecom services due to the presence of a highly competitive mobile market.

In case of mobile telephony, ARPU is not just defined by the user spending in form of the paid bills for the consumed mobile services, but it also includes the revenues generated from incoming calls to a subscriber; since in that case the call receiver doesn’t have to pay anything to its operator due to the CPP (Calling Party Pays) regime; however, the call receiver’s operator still gets a part of the generated revenue (as paid by the caller’s operator to the called party’s operator) in terms of the interconnection fee. It is important to remember a fact that the ARPU (monthly spending) of an

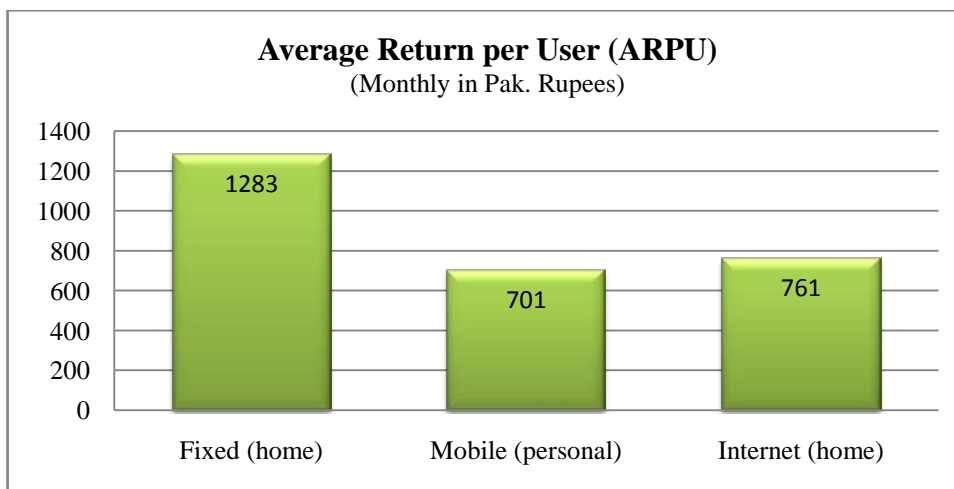
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<sup>14</sup> EVO is the Abbreviation of EvDO (a branded name of PTCL’s wireless broadband service)

<sup>15</sup> SMS and MMS stand for ‘short message service’ and ‘multimedia messaging service’ respectively



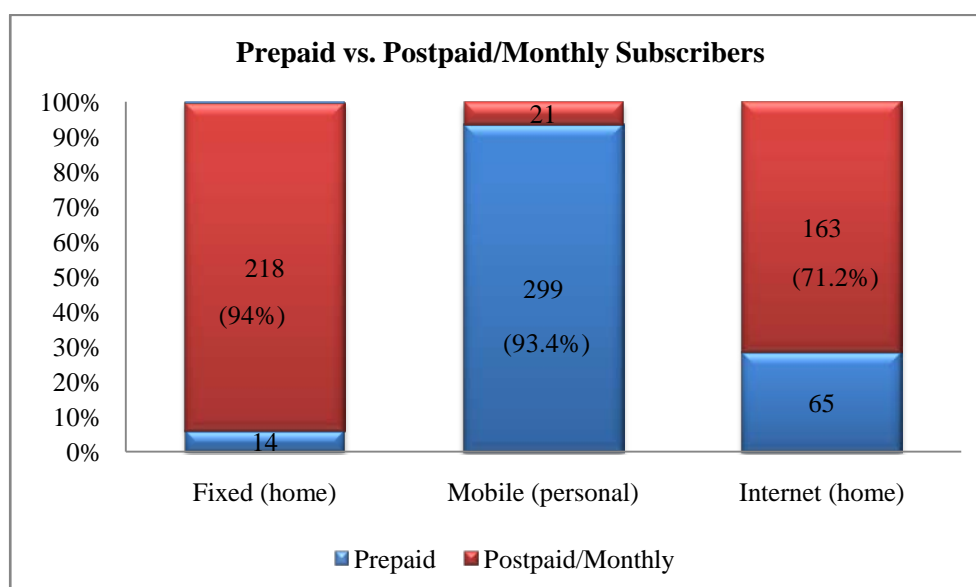
average mobile user in Pakistan is reportedly around \$2 (Rs.170); however, the graph 5 shows it around Rs.700 (approx. \$8). The explanation for this large deviance could be given that the graph is based on the data collected from the selected sample of largely the university students who are supposedly among the most enthusiastic and active users as compared to rest of the general population. The same pattern and explanation should be assumed valid for the other compared telecom services as well.



Graph 5: Average Return per User (Source: Author)

#### 5.4 Prepaid vs. Postpaid Subscription

The graph 6 reflects the status of prepaid and postpaid regimes in terms of the number of subscriptions for each of three compared telecom services, which put forth interesting information. The statistics reflect two exactly opposing trends between the fixed line and mobile services. In case of fixed line service, an overwhelming (94%) number of subscribers are postpaid; whereas in case of mobile phone service, almost the same overwhelming majority is subscribed for prepaid service.

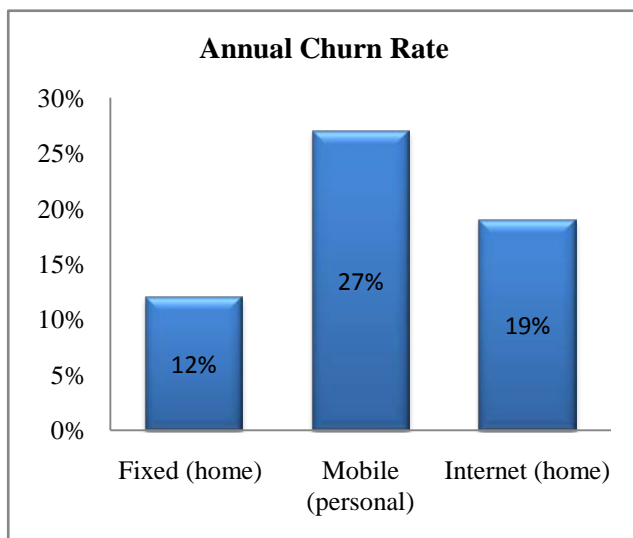


Graph 6: Prepaid vs. Postpaid/Monthly Subscribers (Source: Author)

In mobile phone services, postpaid is preferred to get relatively cheaper rates with additional incentives particularly when calling within the network (on-net) or when the volume of usage is large; since it gives the comfortable sense of feeling free to continue usage without worrying about the credit (balance). Postpaid is generally used by the corporate and relatively affluent users since for them comfort means more than making marginal savings or controlling budget through conscious usage; whereas prepaid has been generally preferred by those users who want to keep control of their spending on mobile services. The trend remarkably alters in case of fixed line and internet (broadband) service where postpaid is an overwhelmingly dominant subscription regime. The reason for this deviation is generally attributed to different level of incentives that present in different services and packages to either keep prepaid and postpaid subscriptions respectively.

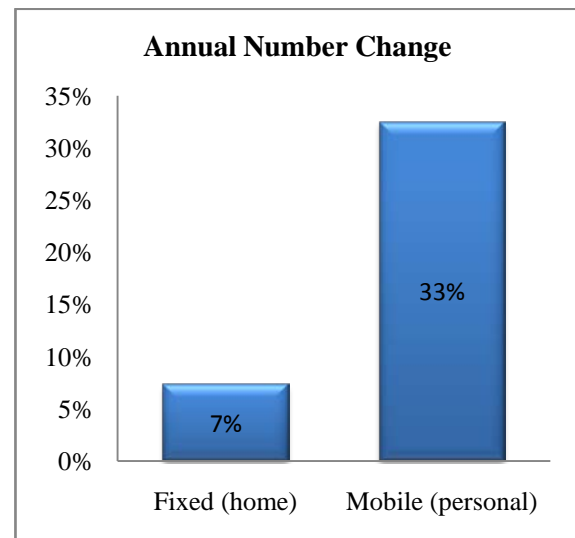
### 5.5 Reasons for Switching the Numbers and Operators (Churn Rate)

The annual churn rate in graph 7 refers to the number of times a telecom subscriber has switched its operator on average in a year. The higher churn rate indicates a lower loyalty on behalf of the subscribers with their respective operators. The graph truly reflects the market situation for each telecom service; where mobile stands high with 27% annual churn rate, meaning that about every fourth customer has changed its operator during a year. On the other hand, the internet and fixed line services come afterwards with 19% and 12% annual churn rate respectively. The statistics also refer to the level of competition and the number of competitive suppliers; and hence referring to the available choices for the customers in case of each telecom service to freely choose among the different competitive suppliers. Since the scale of competition and the number of competitive suppliers are highest in case of the mobile services and lowest in case of fixed line; so the discrepancy within the churn rates in each of these markets can also be seen accordingly.



Graph 7: Annual Churn Rate

Source: Author



Graph 8: Annual Number Change

However, it doesn't necessarily mean that an increased market competition in result of the multiple suppliers would essentially lead towards an increased churn rate as well; since it also depends on

what grounds the current competition is based upon, whether it is only based upon an intensive 'price war' or other parameters are also involved that could further convince the existing customers to stay connected and loyal to the same operator. A relevant interesting feature would be to also check out the annual ratio of 'number-switching' within the fixed line and mobile services to notice how many times a fixed line and mobile subscriber has switched its number annually. The graph 8 reflects that around every third mobile subscriber has switched its mobile number annually (it may also include the number change in result of the change of operator); whereas the annual number change ratio in case of fixed line is merely 7%. The same line of argument as in case of the annual churn rate validates in this case as well; which means that the mobile sector reflects quite a high level of competition; and in result the available options for the number switching are higher than in case of landline. More importantly, despite the fact that the 'Mobile Number Portability' (MNP) regime is fully enforced and quite functional, but still many users prefer to switch their numbers as well when switching the operators; and that may also involve other factors such as protecting their privacy for some reasons. In case of fixed line service; however, no such 'Fixed Number Portability' (FNP) service yet exists.

In the following analysis, the author summarizes the main reasons as pointed out by the users for their switching of operators and numbers. The mentioned reasons for both switching the operator and numbers in case of the fixed line and mobile services have been combined here for the sake of simplicity; while the reasons given for the change of operators in case of internet has been discussed separately.

### *Fixed Line Services*

The most important reason for switching the operators in case of fixed line was mentioned the deteriorating Quality of Service (QoS) that include the issues like: the line problems (dead line or no dial tone), distortion and cross-talk (or noise) by other calls, problems in local side cabinet, and generally the poor customer and technical support service with an unacceptably delayed response time. The second major reason for switching from the fixed line service or the fixed line operator has been stated the relative incentive (advantage) in case of subscribing for better and more innovative technologies that increasingly make the user independent of the fixed line service; such as the mobile phone service which replaces the need to have an additional landline connection to a large extent, which is added by the fact that there is a gradual transition from the narrowband dial-up modem and relatively slower DSL connections towards the high-speed fiber based (FTTH) and broadband wireless services. However, the major reason mentioned for changing the fixed line number was told the geographical relocation (e.g. due to the home shifting) in the absence of FNP regime, hence leaving no option for the user to retain the previous number at the new geographical location if it locates in the access area of a different local switch office. Followed by that, the next mentioned reason for the number change was mentioned the user's felt need for protecting its privacy (if feared to be violated) in order to avoid receiving any absurd or unwanted (malicious) calls on a leaked out number.

On the other hand, a very small number of respondents mentioned the higher prices or the lack of billing transparency among the major reasons for switching the operators in case of fixed line. However, it may also be due to the fact that the users currently do not have much competitive options to switch around in case of fixed line service, the way they have multiple choices in case of mobile services. Moreover, the factors like the unacceptable delays in acquiring the first time connection and the low coverage or accessibility have also been not counted among the noticeable reasons for switching the fixed line operators.

### ***Mobile Services***

In case of mobile services too, the most important reason for switching the operators has been mentioned the experienced poor QoS that includes mainly the technical and network related problems such as: the poor voice quality, weak signal strength, call dropouts, and the coverage and connectivity related issues. Following the QoS issue, the next major reasons were pointed out the 'price sensitivity' related elements, since a large majority of price conscious mobile customers mainly switch to other networks to get a better priced package (cheaper rates), or due to the lack of billing transparency that make them dissatisfied with the current operator. On the third place, it has been the desire of getting better features and innovative services from the new operators. The major reasons behind switching the mobile numbers were mentioned the privacy factor (i.e. to avoid unwanted, missed and malicious calls due to number 'leakage') and the security related issues (such as mobile stealing and robbing which resulted in the loss of SIM as well). However, in case of mobile services, the presence of an effective and functional MNP regime now increasingly facilitates the users to switch around different networks but without having any technical issues with respect to keeping the same number.

### ***Internet Services***

Once again, the poor QoS has been called the most important reason for switching the data or broadband operators. The elements mentioned with respect to the bad QoS included the issues like: the operator's inefficiency, bad network connection, weak signal strength in case of the wireless and mobile internet services, and slow network speed (data rate). The respondents were found quite keen to switching to other available and affordable options in order to upgrade the service quality and the provided data speed. The respondents (mostly the students) were strongly willing to switch to a promising network in order to get an improved mobility and wireless connectivity, and better features and a higher data rate. However, in case of internet services, the users didn't count the acquisition of better price packages, billing transparency, or any issue related to geographical portability in case of relocation as among the major reasons for switching the operator.

### ***Some Reflections and Inferences***

In this sub-section, the author briefly reflects upon some of the above mentioned facts and figures; and thus some inferences have been made here accordingly. The 'technological lock-in' (Perkins, 2003) and 'path-dependency' (Rosenberg, 1994) effects have been discussed in the recent and past literature to highlight the restricted choices available for a consumer in switching to a new product or technology due to the inherent incompatibility, information asymmetry, bounded rationality, and standardization related issues, as involved in the decision making process; hence, causing

formidable ‘switching cost’ for a user to undergo, if considering to switch a particular product, technology or an operator. However, apart from the ‘technological lock-in’ effect, the author here feels the need to coin a term ‘social lock-in’ to highlight the lock-in effect that a user usually experiences while making the switching decision due to the user’s social attachment with a particular social network, service or application, its emotional attachment or the feeling of comfort with the usage of a particular product, or its social bonding (or the sense of prestige) with a particular brand.

The author observes a positive correlation between the presence of ‘social lock-in’ effect and the user’s ‘loyalty’ with any particular brand of product and service or with an operator; and hence, the greater the social lock-in effect, the more customers’ loyalty is expected to be observed. For example, a telecom user generally prefers to be the part of the same communication network as most of its family and friends are part of, in order to get more social attachment and association with his/her ‘close circle community’. However, it may also be partially motivated by the fact that there are usually offered cheaper rates for ‘on-net’ communication (i.e. communicating with the users of the same network), as compared to making ‘off-net’ calls to the subscribers of other networks. However, in the lock-in context, the author currently observes quite a weak customer’s loyalty element with any particular service brand or with a specific telecom operator in Pakistan; when compared with the users’ usually a stronger attachment with a specific vendor’s branded products such as in case of buying a laptop, mobile or an operating system. The author assumes that an operator may also capitalize on the ‘social lock-in’ element gradually with the help of an intentional and well-executed plan, aiming at growing the user’s emotional attachment and psychological satisfaction with a particular service offered by that operator. In addition to the commonly used pricing strategy, this could also be done through developing interesting and relevant contents and applications targeted to a particular segment of users or a community, and also taking optimal advantage of the known phenomenon of ‘networking effect’.

The ‘network-effect’ (Katz and Shapiro, 1985), also known as the ‘positive network externality’ or ‘demand-side economies of scale’, essentially refers to the fact that the real worth and value of an ICT based network depends on how many other people have also joined the same network. For example if one’s immediate family and friends are not using landline anymore and most of them have instead migrated to the mobile phone service, then in that case keeping the subscription for a landline connection would have less worth for that particular person, since it would cost additional to call at a mobile number from a fixed line connection and vice versa. The phenomenon of ‘networking effect’ has critical significance in the ICT related diffusion analysis, since people prefer to become part of the larger network than of a smaller network; and hence, it creates the ‘positive feedback’ or ‘bandwagon effect’, where the success breeds success and failure leads to further failure (spiral effect). It eventually results in an extreme outcome in form of a ‘tipping market’ that often ends up in a ‘win-lose’ situation; hence, leaving only one ultimate winner in the market. The above discussions are equally valid in case of all of the three compared telecom services i.e. the fixed line, mobile and internet services.

The concept of ‘product bundling’, especially the possibility of subsidized handsets at an attractive price has not been seen yet a viable solution in case of Pakistan, primarily due to the relatively weaker ‘customer tracking system’ when compared with the experiences of the developed countries. Hence, it involves a higher risk in terms of the recovery of the subsidized handsets or even the recovery of the original investments, if the customer defaults in paying back the due amount in set installments. Probably, that is one of the major reasons why the acquisition of subsidized mobile handsets was not mentioned among the major reasons for switching the operators. But most recently the trend is observed to be likely changed, since some operators are now engaged in aggressive marketing campaigns for bundling their services with the subsidized mobile handsets at very attractive prices; however, in that case the customer pays at once the total lump sum price of the subsidized handset. Surprisingly, the operators now offer these subsidized handsets with their own brand name; hence the role of vendors (i.e. the handset suppliers, not the ‘original equipment manufacturers’) seems to be gradually diminishing from the local mobile market, if this trend further grows. However, it is yet to be seen how the vendors would strategically react to the operators’ potential entry into their core business.

## **5.6 Multiple SIM Cards & Mobile Teledensity**

The current survey has revealed that the average number of SIM (Subscriber Identification Module) cards held by a mobile subscriber in Pakistan is 1.63 SIMs/subscriber which means that the actual number of subscribers in Pakistan would be around 67 million out of the total 109 million issued SIMs (est. June 2011). The above projected figure quite closely resembles to the qualified estimations made by different telecom industry experts during the interview sessions. The mobile teledensity in Pakistan is measured by the number of issued SIM cards instead of mapping the mobile teledensity through assessing the actual number of subscribers. The author presumes that using the actual number of users as a benchmark to measure teledensity and the impacts of telecom services would be rather a more realistic assessment.

The reasons mentioned by the users for keeping multiple SIM cards can be placed within three major categories: ‘affordability, price sensitivity and cheaper packages’; ‘coverage, QoS and accessibility’; and the ‘privacy and personalization’ relevant issues respectively. The users were generally found most eager to keep multiple SIMs of different operators in order to take optimal advantage of the various economical packages offered by different operators. However, some cellular operators consider that due to the present extremely low prices of the mobile services in result of an ongoing cut-throat price competition among the operators, the ‘price elasticity’ factor has already been fully exhausted; hence, any further drop down in the prices is not expected to substantially expand the market volume, neither in terms of enhanced voice and data traffic nor by a drastically expanded user-base.

The second major issue was related to the coverage, connectivity, QoS and accessibility. These problems were faced by the users both in the urban and rural areas, but the nature of the problem has been essentially different; however, in both cases the QoS concerns were raised by the users. In case of the urban areas and large metropolitan cities, the actual issue was to deal with the traffic

congestion; and in result, the interference and call dropping issues faced by the users probably due to the problems with the network design and its optimization. On the other hand, in case of the rural areas the real issue was about the connectivity and service accessibility, due to the lack of required network coverage. In such situations, it has been often experienced by the users that if one 'network coverage' is not sufficient to establish a communication link (or a call) then the other operator's network might possibly provide enough coverage to assure better connectivity. Due to this reason, many respondents prefer to keep multiple SIM cards of different operators in order to ensure the omnipresent accessibility and connectivity at any the time, especially in case of emergency. Within this category, another challenge has been described the accessibility issue to the particular physical places (shops) for the credit refilling. Since, an overwhelming majority uses prepaid connections; hence, many people prefer to have credit uploaded on multiple SIM cards in order to avoid any mishap or undesired situation, if the credit ends in one SIM card and the user couldn't find any shop nearby to reload credits on its SIM card immediately. It is important to remember that still the most commonly method used for refilling the credits in the country is to personally going to a shop; since internet and mobile banking options are apparently irrelevant from the common man's perspective, knowing the fact that the internet teledensity (broadband) is still less than 1% in the country (est. 2011).

The 'privacy and service personalization' category include the discussions related to the privacy issues such as switching the numbers (multiple SIMs) in order to avoid disturbance caused by unwanted calls and messages; and the issues related with the service personalization and user preferences such as keeping multiple SIMs either for the different specific groups of people e.g. family & family, or for the specific purposes e.g. personal vs. official calls. Within the service personalization concept, it is relevant to reiterate the discussion that users keep multiple SIMs of different operators in order to effectively get benefit of the different packages offered by these operators on competitive basis. These packages are based on time-specific (e.g. day and night packages), person-specific (e.g. family and friend packages), location-specific (e.g. calling within country or abroad), or the service utilization-specific (e.g. short calls or unlimited calls). Hence, the variations in packages offer the desired flexibility and service personalization opportunity for the user to choose the best package that accustoms with a user's specific needs and requirements.

However, there is another group of users who keeps multiple SIM cards just for fun, without having any compelling or convincing reason for keeping multiple SIM cards. They just want to make a collection of multiple SIMs, since it was given for free. This case typically reflects the classical theory of human behavior called 'tragedy of the commons' (Hardin, 1968), which emphasizes on the fact that people do have a general tendency to unnecessarily exploit (waste) the abundant and freely available public resources; hence creating a potential shortage of even those abundant resources.

## **5.7 Reasons for the Adoption of Telecom Services**

The following graphs depict comparative illustrations of the reasons of adoption for the fixed line, mobile and internet services. The users were asked to rank on the likert scale a given list of seven potentially major reasons in reference to the adoption of each of the three compared telecom



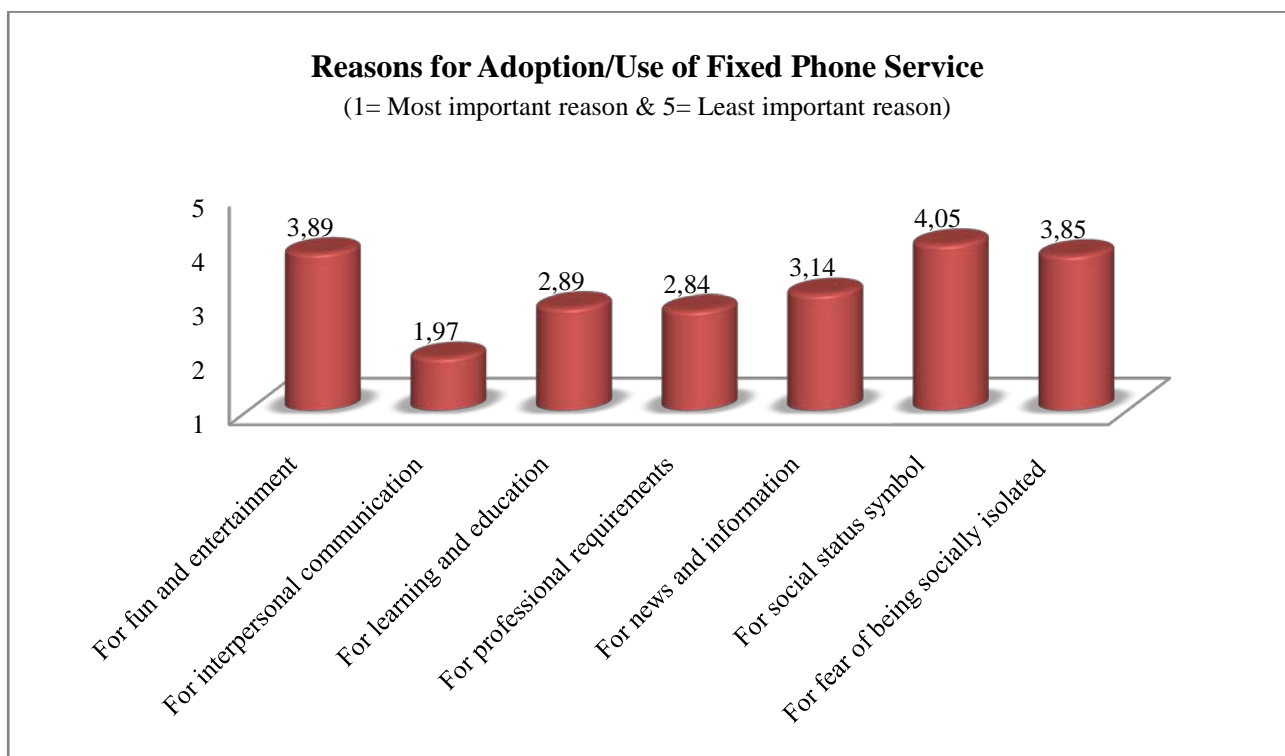
services. It is important to explain here that some of the listed reasons mentioned in the following four graphs (i.e. graphs 9-12) are the shortened versions of the original texts presented in the questionnaire (see appendix 1). Hence, for the readers' convenience it is reiterated here.

For interpersonal communication = for interpersonal communication and strengthening the social relationships

For social status symbol = for representing the use of these services and the associated gadgets as a social status symbol

For fear of being socially isolated = for the fear of being socially isolated if not adopted/used these devices/technologies (since the other friends and relatives are already using or soon going to adopt these services)

Some interesting results appear out of these graphical illustrations which are presented below.



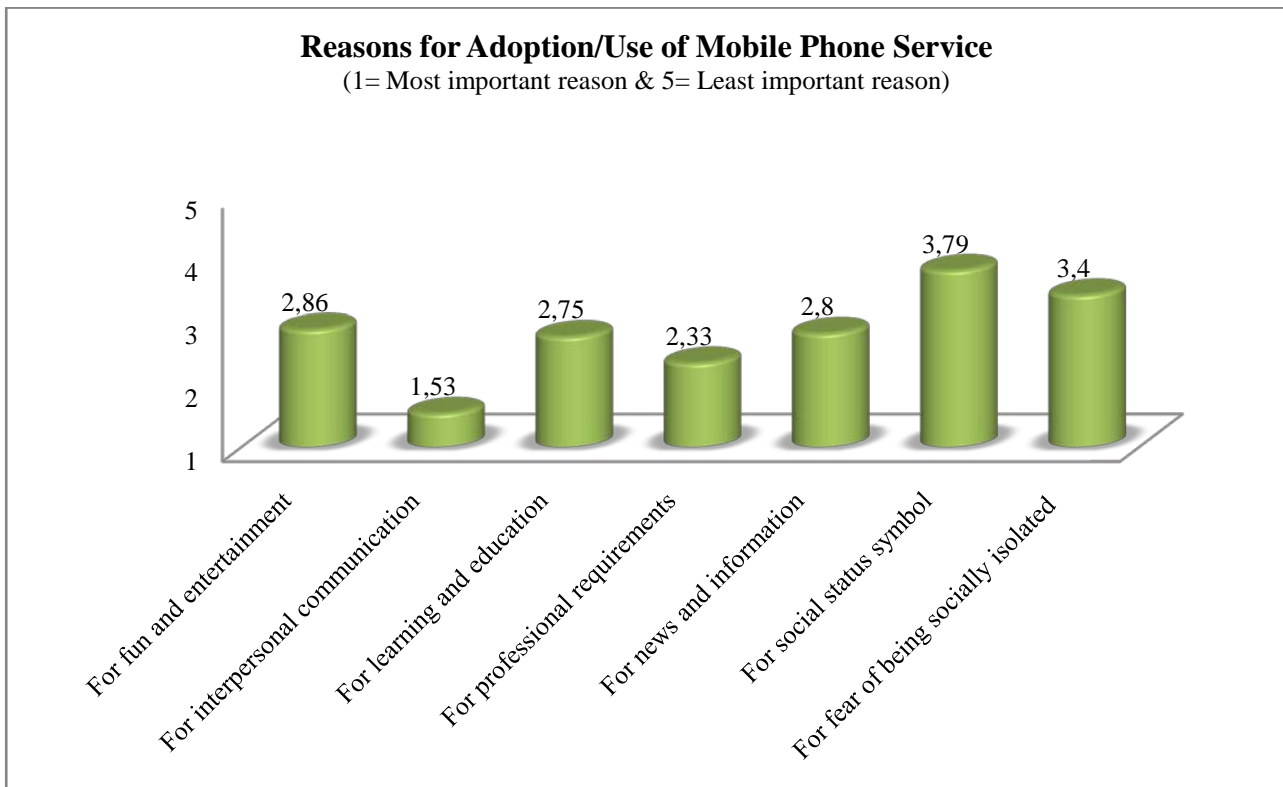
Graph 9: Reasons for the Adoption/Use of Fixed Phone Service

Source: Author

The above graph explains that fixed telephony is primarily used for the interpersonal voice communication (at home), and followed by that the service is mostly used for fulfilling the professional and business requirements such as at offices and shops. A mediocre use of the fixed telephony has been also identified for learning and the news/information sharing purposes. However, the users don't consider landline telephony a medium to be used for fun & entertainment applications. They also don't consider that in case of not using this service, they are afraid of being socially isolated or feel disconnected from the communication world; since the advent of mobile



and internet services have replaced the indispensable need of having the fixed telephony as the primary mode of communication. The image of fixed telephone has obviously left no apparent charm or appeal in the users' mindset to consider the landline service or gadgets as a symbol of their social status anymore.

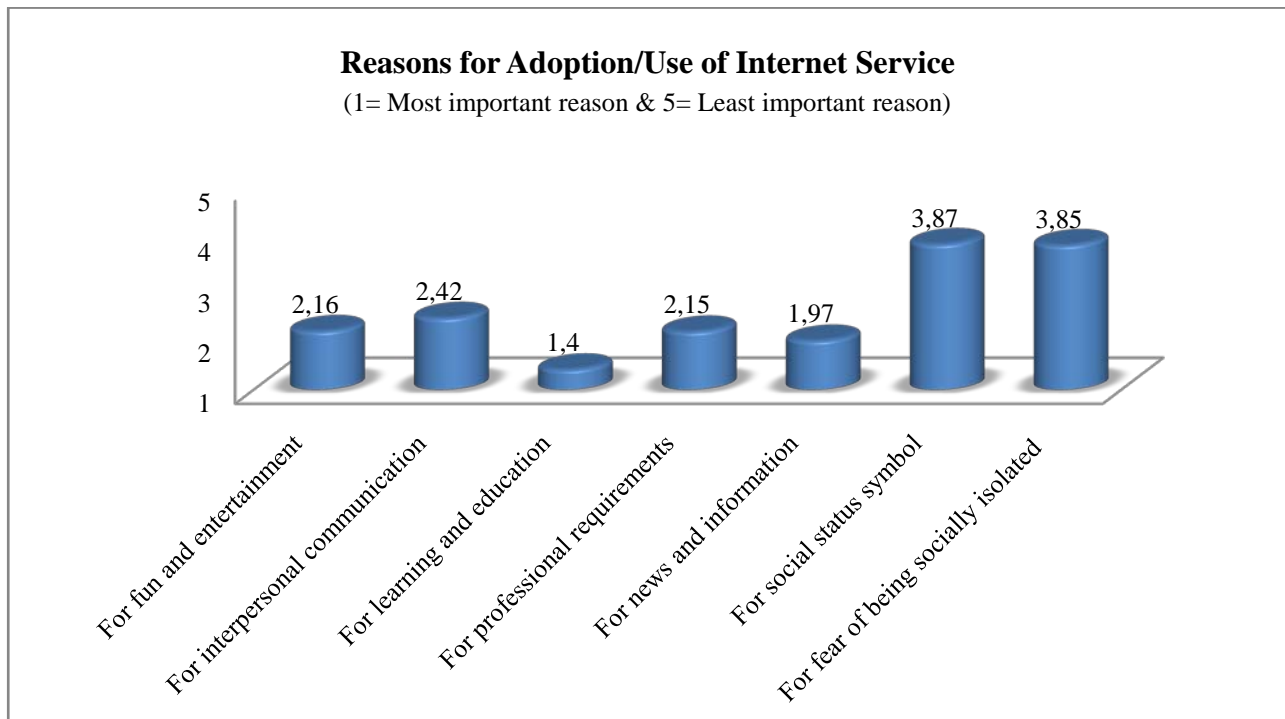


Graph 10: Reasons for the Adoption/Use of Mobile Phone Service

Source: Author

In case of mobile telephony again, the most critical use for which the users primarily adopt this service is their interpersonal communications with a range of people of their interest. Similar to the case of fixed telephony, the other prominent use of mobile telephony is to fulfill the professional communication requirements. However, in both of the above applications, the use of mobile is increasingly replacing the need and importance of having fixed telephony any longer due to the inherent advantageous features and user-friendly attributes of the mobile services. Its use for learning/education and news/information sharing is again kept on the mediocre level, similar to the case of fixed phone service. Interestingly, the mobile use for fun & entertainment is considerably high when compared with fixed telephony. In the absence of mobile service, the level of fear of being socially isolated is also higher than fixed telephony. Surprisingly, the factor of representing the use of mobile as a social status symbol has been shown quite low (even though above than the fixed phone), which was an unexpected result to some extent as per the general observations and the results of other documented evidences. The author presumes two possible reasons for this deviation: first that the mobile has now become so much in the common use of everyone, that now genuinely its use is no longer considered a privileged thing to be represented as a symbol of status

quo; or secondly, may be the respondents were trying to be a bit humble or shy in admitting the fact that there is a great hype and craze among the youngsters of proudly showing off their mobile gadgets as part of their personality. However, the common observation reflects that the users (especially the youngsters) feel proud of using expensive and advanced mobile handsets.



Graph 11: Reasons for the Adoption/Use of Internet Service

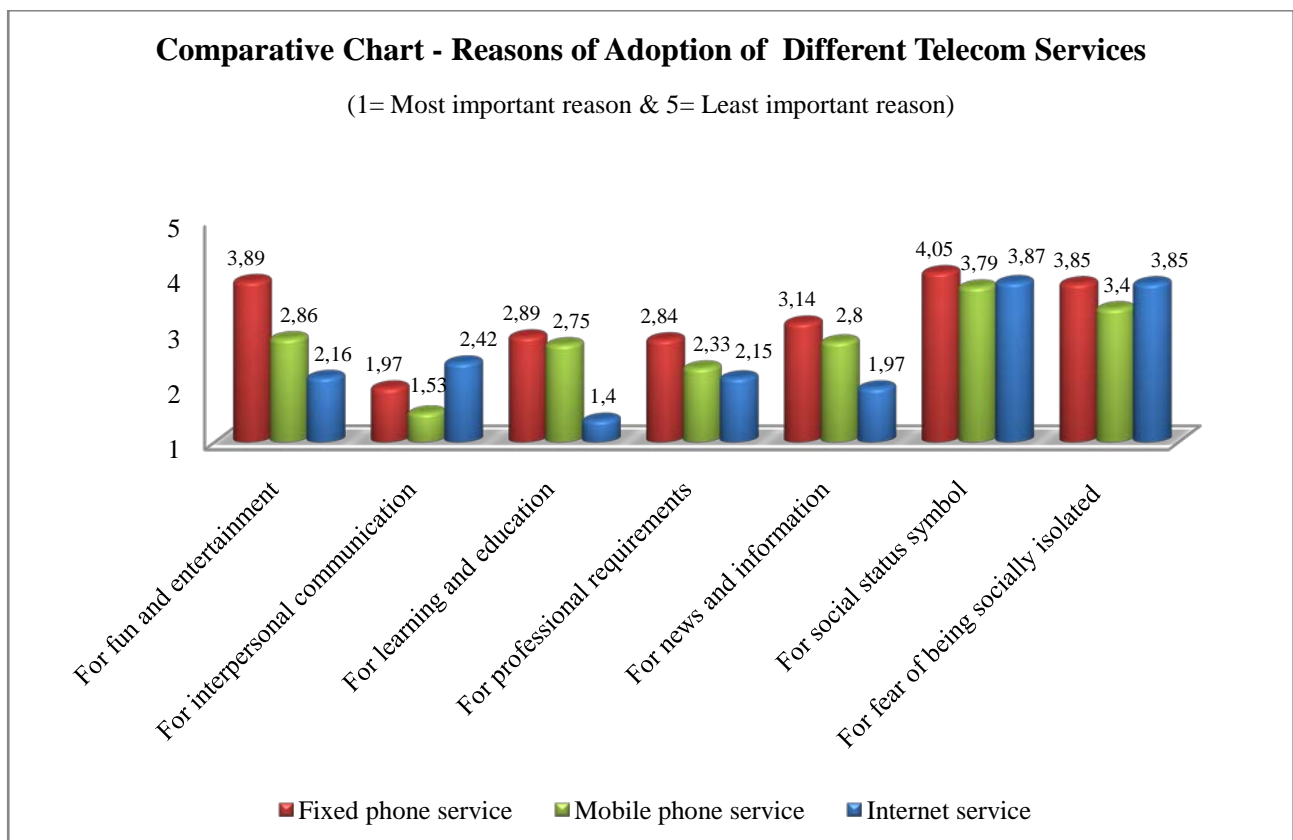
Source: Author

Finally, in case of internet services it is apparent from the above graph that its most obvious use has been considered for the learning & educational purposes, and then for acquiring news & information. Followed by that the next important use of internet has been told the fun & entertainment relevant applications, and fulfilling the professional requirements at work. Of course, it should be understood that 'learning and education' has been given the highest rank of service adoption here because the survey has been conducted among the students; however, the author strongly presumes that if the survey would have been conducted from the professional people then they would have most probably ranked 'the need for fulfilling the professional requirements' among the most important reasons for internet adoption, especially within the business community.

The survey results reveal that internet has not been primarily used for the interpersonal communication as in case of the mobile and fixed line services. On the other hand its use for the professional requirements is rather considerably higher than the other two compared services. Again internet and its relevant gadgets such as laptops or desktops were not regarded as the symbols for their social status. One possible reason for that humble response in this case could be the fact that laptop has been still found not a common gadget in possession of majority of the students and it was estimated that less than 10% of the respondents have owned their own personal laptops. On the

other hand, the desktops are still commonly used for accessing internet services in Pakistan, which generally all look quite similar; and hence no significant elements of any charm or appeal for the users to feel distinguished for. However, the element of social isolation in case of not adopting the internet service is relatively lower than the case of mobile phone, but quite similar to the case of fixed line which can be explained by the fact that both the internet and fixed phone services still have less than 5% teledensity respectively (est. 2010).

The following graph illustrates a comparative chart of the three compared telecom services using the seven reasons' benchmark, as they have been separately discussed above. However, the comparative chart makes it easier to clearly look at a glance at the differing trends with respect to the adoption of each of these compared telecom services, as per the users' perceived given importance. The graph vividly explains that internet has been primarily adopted in Pakistan because of the learning & educational purposes, for acquiring news and information, for fulfilling the professional requirements (e.g. through emailing and professional networking), and for the fun and entertainment relevant applications. On the other hand, the most prominent use of mobile service is for the interpersonal communications and to remain socially connected with friends and relatives. Whereas, the need for adoption of the fixed line does not stand high on any category; which clearly reflects the diminishing need of the fixed line in the users' perception to be adopted any further.



Graph 12: Comparative Chart - Reasons for the Adoption of Different Telecom Services

Source: Author

Based on the analysis of both the quantitative and qualitative parts of the questionnaire, the major reasons for the adoption of the compared telecom services have been recapped here again. The fixed line service has been called mainly used for the interpersonal voice communication, while being stationary; such as being at home, in office or the shop. Fixed line is also used frequently for the fulfillment of professional and business requirements. On the other hand, the main use of mobile services has been also called the interpersonal communications, but while roaming; and also for the fulfillment of the professional and business communication requirements. Mobile has been commonly preferred due to its interesting features and user-friendly attributes. Mobile has been called a major means for saving time due to its quick and interactive nature of communication, which provides an always-on and omnipresent connectivity for the communication and information sharing purposes; and hence significantly easing the daily life activities. Mobile has been now increasingly seen as a personal gadget and an indispensable part of the life. Finally, the internet has been currently used primarily for the fun & entertainment related applications, acquiring or sharing news & information, learning and education purposes, emailing, blogging and chatting at social networking websites, and for effectively maintaining a large pool of friends and social relations.

### **5.7.1 Comparing the Intrinsic Attributes**

There has been a common trend observed all across the world that the fixed line subscribers are increasingly migrating towards mobile telephony, primarily due to the intrinsic technological edge of mobile telephony over the fixed line service, and hence it almost replaces the need for having a landline connection. In result, the situation turned out the fixed phone practically a redundant service in the presence of mobile service. But in case of a developing economy such as Pakistan, this fact alone cannot explain and unfold the whole dilemma; since the growth of fixed line was already too low even before the advent of mobile telephony, which justifies the approach of looking at the collective picture through bringing all the pieces of the puzzle as part of the investigation.

This section briefly explains some of those intrinsic attributes which in essence significantly differentiate and give an edge to the mobile service over the compared telecom services; hence, provides another reason for its relatively an increased adoption in the society. The suppliers may better position their products and services if they evaluate the relative strengths and weaknesses of their products as compared to the competing products, serving similar solutions to the consumer market. Hence, this short section might be useful in that context to highlight some of those intrinsic attributes of mobile services that the users really give value to, as per their responses.

#### ***The Elements of Aesthetics and Ergonomics***

On comparing some of the intrinsic attributes of the telecom services, the users were seem to be quite convinced that there was no match between the mobile and fixed line handsets & their different services and applications in terms of aesthetics (the relative sense of beauty and aesthetic charm) and ergonomics (the relative comfort in the usage of a product or service). Mobile has been called highly attractive and fascinating due to its uncountable numbers of trendy, beautiful, and colorful models as they appear in the shelf with the support of a powerful image built by the mobile phone vendors and operators through their intensive marketing and media campaigns. In addition to these aesthetical elements, the new mobile phones are considered highly comfortable in their usage;

not only due to their portability and light weight factors, but also due to the relative comfort they offer while using and interacting with these devices (as being supported both by the wired ear-plug and Bluetooth technology in order to be effectively used even when physically engaged with other stuff; and also due to being supported by the voice recognition and touch screen functions). Some of these practically useful elements in terms of ergonomics are even missing in the traditional computers as well, especially when it comes to compare the trendy styles, the element of portability and the touch screen features.

### *Increased personalization, personal control and privacy*

The mobile service has been considered offering an increased possibility for personalizing the handset, and the different features and applications on it that essentially makes the subscribed services highly customized and in line with the user's specific interests and requirements. In comparison, the respondents consider very low possibility for designing such a tailored-made product in case of fixed line services. On the other hand, even though internet service and its associated computing products may also provide such possibilities; however currently in Pakistan, this trend has not been yet fully utilized in an optimal way; both in terms of the subscribed applications and services with respect to the 'billing' (through 'unbundling of services') but also in terms of the received 'contents'. Moreover, mobile gives an enhanced user control over the mobile applications, contents and its usage, which greatly helps in protecting the user's privacy as well, particularly when compared with the fixed line and internet services.

### *Service Relevance and Context of Usage*

The users' preferences to subscribe for a particular telecom service significantly change with respect to the context of usage. The respondents explain that people do have differing preferential order when subscribing for different services, depending on the context of usage and their particular requirements accordingly. It is found that the users' preferences for choosing a particular service or package often considerably vary, when they think only about their family and friends, as compared to when they primarily consider their businesses or the official/professional requirements. Similarly the preferences for the subscription also considerably vary with respect to the 'frequency of usage', the 'geographical distance among the communicating parties' and the specific 'time of usage'. Hence, the need for occasional communications would have different implications as compared to the frequent and excessive communicational requirement. Similarly, communicating within the local community or within the country have quite different implications on setting the subscription preferences when compared with the requirement of frequently calling abroad for managing business or personal relations. In the same way, the subscription packages for the use of ICT services during the off-peak hours (6pm-6am) have quite different rates as compared to the users' requirement for using these services during the peak hours.

The 'usability' (in terms of the frequency of utilization) and 'value' (in terms of the relative importance and worth) of a product or service have been considered as relative concepts, which need 'not' to be understood in absolute terms. For example, even though a user gives most importance and value to certain features or applications of a service (such as the mobile internet service) doesn't necessarily refer that its usability (frequency of usage) would also be high. It is

because in case of mobile internet for example, the other influential variables such as; its relatively higher price (affordability issue), the relative comfort of usage (ergonomics factor) and poor QoS (relatively slow data rate) may also play critical role in affecting the usage pattern and the frequency of utilization of the mobile internet service. Hence, despite the fact that the mobile internet service may potentially have high value and worth for a particular user, but due to its relatively higher charges, slower data rate, and smaller size of the screen and touchpad, the user may behave cautiously and more hesitantly while using or subscribing for the mobile internet service. On the contrary, a user who does a lot of text messaging (as reflecting very high usage of SMS service) doesn't necessarily mean that he gives most value to text messaging service; since this frequent pattern of usage may also indicate the relatively much lower prices of this service, particularly in case of the price-conscious users.

### ***Interactivity and Functionality***

It has been told that the average available sets of fixed telephony in the local market generally do not support the full scale of features and functionalities regarding voice, messaging, data organizing and other range of interactive services that the mobile users generally experience while using their mobile phones. The value-added services (VAS) currently available on their fixed phone have been considered relatively quite limited, which makes the image of a fixed phone more like an old-fashioned stationary box with offering relatively much lesser functionalities and attractive features. On the other hand, the mobile phone is considered to be full of interesting features and functionalities; and hence capable of supporting many services and applications such as camera, video, MP3, radio, TV tuner, GPS (Global Positioning System), recorder, Bluetooth, calculator, clock, timer, alarm, compass, calendar, organizer (notes and reminders), internet browsing, RSS feed (Rich Site Summary - online regular feedbacks), emailing, text messaging, multimedia messaging, voice and video calling, and range of other smart phone applications. This increased 'functional integration' within a small digital gadget available at an affordable price, has been considered one of the major reasons for its wider popularity and adoption among the masses, when compared with the fixed telephony. It has been further told that, no matter if a user is capable of using all those available features and functionalities or not; but at least it gives a sort of comfortable feeling to the user that there is a smart device in his/her pocket, which is fully packed with all those immediately accessible interactive features & applications.

### ***Mobility, Omnipresent (Ubiquitous) Connectivity and the Sense of Connectedness***

It was found that primarily it is the 'sense of connectivity (connectedness)' with rest of the world anywhere at any time that the mobile users really feel and enjoy when making use of their mobile phones at any moment of their choice. This need has been emerged even more powerfully when other people are also being watched around us as connected with each other using different telecommunications networks; hence it again refers to the phenomenon known as the 'networking effect' or 'positive network externalities'. This effect has been seen particularly quite obvious in case of the telecom networks. The telecom suppliers fully understand the importance of capitalizing on this effect. However, the fixed line and internet services by no means can replace or compensate for that sense of mobility and ubiquitous connectivity, which a user currently can experience with the use of mobile services in the country.



### **Product Complexity**

People do report different sorts of difficulties while using or interacting with different ICT services and devices. It has been noticed a common need among the users, demanding that these devices and services should have been made as simple and user-friendly as possible. For example, it will be more fun for kids to have a mobile or computer with very simple buttons, and an interesting and charming layout of the keypad (or key board) with colorful screen and some cartoon characters. Similarly, for elders the buttons and characters of mobile and computers can be designed a bit larger in size in order to help them easily viewing, comfortably dialing numbers and typing the text. It has been further told that the simplicity of ICT products and services should be brought to a level, where even a layman could also make use of it.

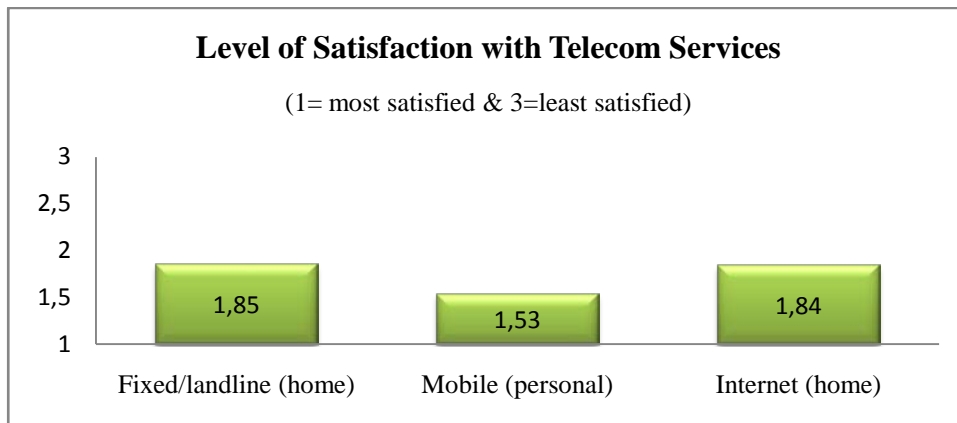
The product's reduced complexity may also help addressing the 'social lock-in' factor, which has been considered a major barrier in the adoption of ICT products and services; not only among the less educated people, but surprisingly to a higher degree in case of the well-educated and professional people as well. This would also help overcoming the existing fear and hesitance that has been particularly found present among the elderly people; and those who have less interest or exposure to these relatively unfamiliar gadgets and services e.g. in case of the traditional house wives who apparently represent a significantly large proportion of the society. An example is given here to highlight a particular case for the readers' consideration. It has been informed by the respondents that people often chat on SMS and email by taking support of writing Urdu messages in Roman English (i.e. using English alphabets to communicate Urdu messages) to effectively make use of the English layout of the keypad for their daily textual communication. It is primarily because the available software for typing in Urdu language (such as 'In-page') has been called too sophisticated and cumbersome (not 'user-friendly') to be efficiently used for easy typing, considering the case of a common man. Probably that is one of the major reasons why people still prefer composing their SMS and emails in Roman English than typing Urdu in its own script.

## **5.8 Reasons for the Users' Dissatisfaction from Telecom Services**

In the following discussions, the author attempts to investigate the reasons of the users' dissatisfaction with the used telecom services, as looking from different perspectives. The data interpretation is based on the received inputs from the questionnaires (both the quantitative and qualitative parts); and the verbal explanations made by the selected users during the interviews. The combination of data received from multiple sources of information has clearly helped in improving the understanding of the users' points of view on different issues.

### **5.8.1 The Graphical (Quantitative) Analysis of the Reasons for Dissatisfaction**

The following graph depicts the fact that the telecom users are relatively more satisfied with the mobile services than with the fixed line and internet services. The level of dissatisfaction in case of the internet and fixed line services has been found equally high.

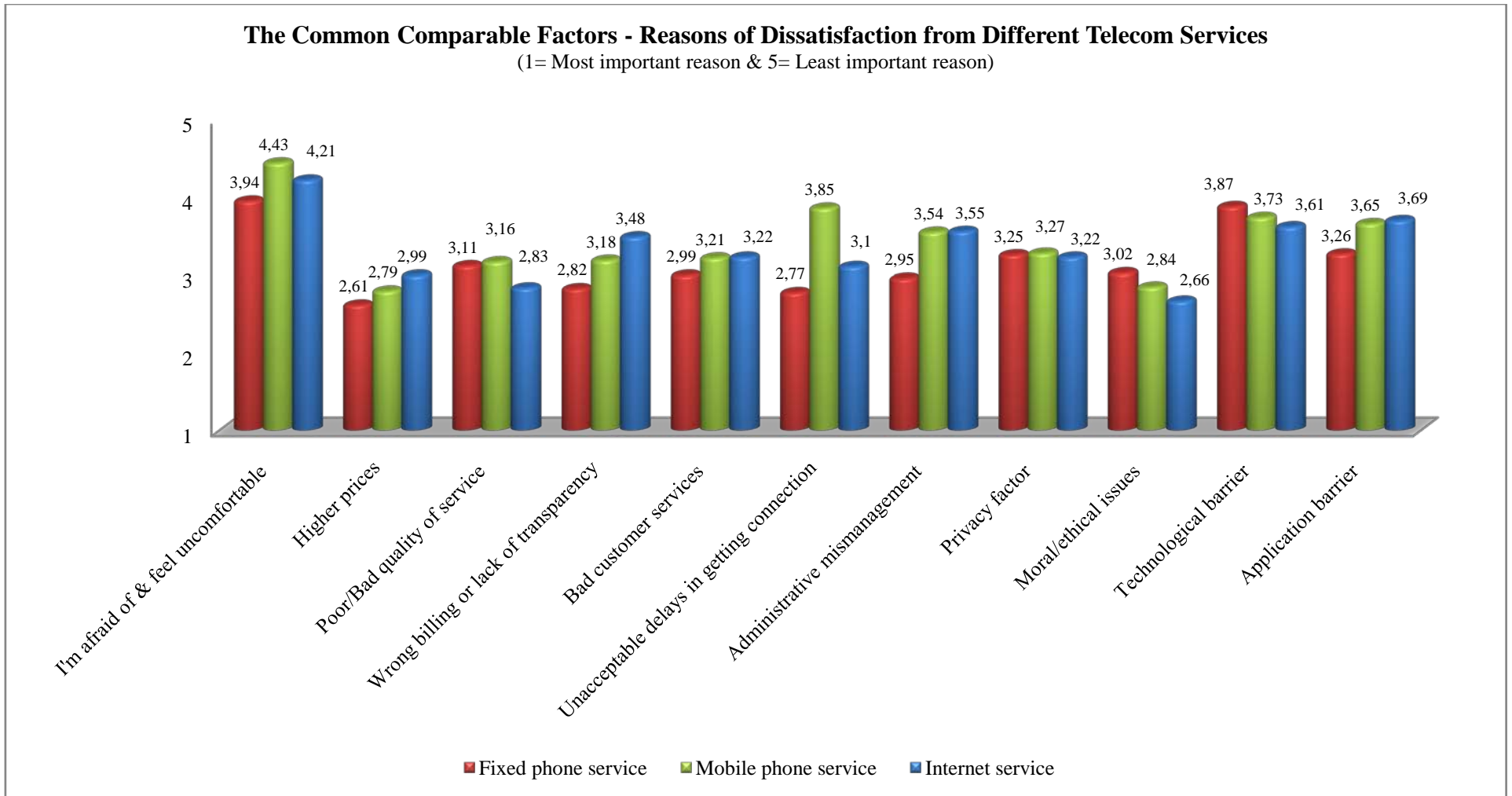


Graph 13: Level of Satisfaction with the Telecom Services (Source: Author)

In the following analysis, the emerged data categories have been discussed in the chronological order, as per the frequency of inputs received for each category of the listed topics. It is interesting to note that possibly there might also be some degree of deviations within the users' own responses as received from the various sources of information (such as the inputs based on Likert scale of the questionnaires, commentary sections of the questionnaires, and interviews). Hence, the emerged patterns of different data categories in terms of their relative importance from the users' perspective may significantly vary. This may probably be due to the fact that the respondents might feel more space in the commentary sections and during the verbal discussions in order to openly speak their hearts and minds without being restricted within the structured boundaries, which are commonly placed by the researchers during the employment of their questionnaires. Hence, a researcher needs to properly acknowledge the value of the respondents' both descriptive and verbal expressions; in parallel to the data that is received from the structured type of questionnaires.

Here below a comparable chart is presented first, in order to provide an overall picture regarding the compared telecom services. This combined chart would follow further discussions about each of the individually sketched graphs of the three telecom services. However, the common comparable factors in the following graph (graph 14) only include those factors that were found to be common among the compared telecom services; so that the possible variances in their patterns could be identified. The comparative chart highlights the major reasons of dissatisfaction, as perceived by the users. Some of these results are seemingly a bit unexpected, especially when comparing with some of the results that apparently come out of their descriptive and verbal expressions; however, the author assumes that all these deviations need to be understood in the right context in order to properly explain the emerging patterns.



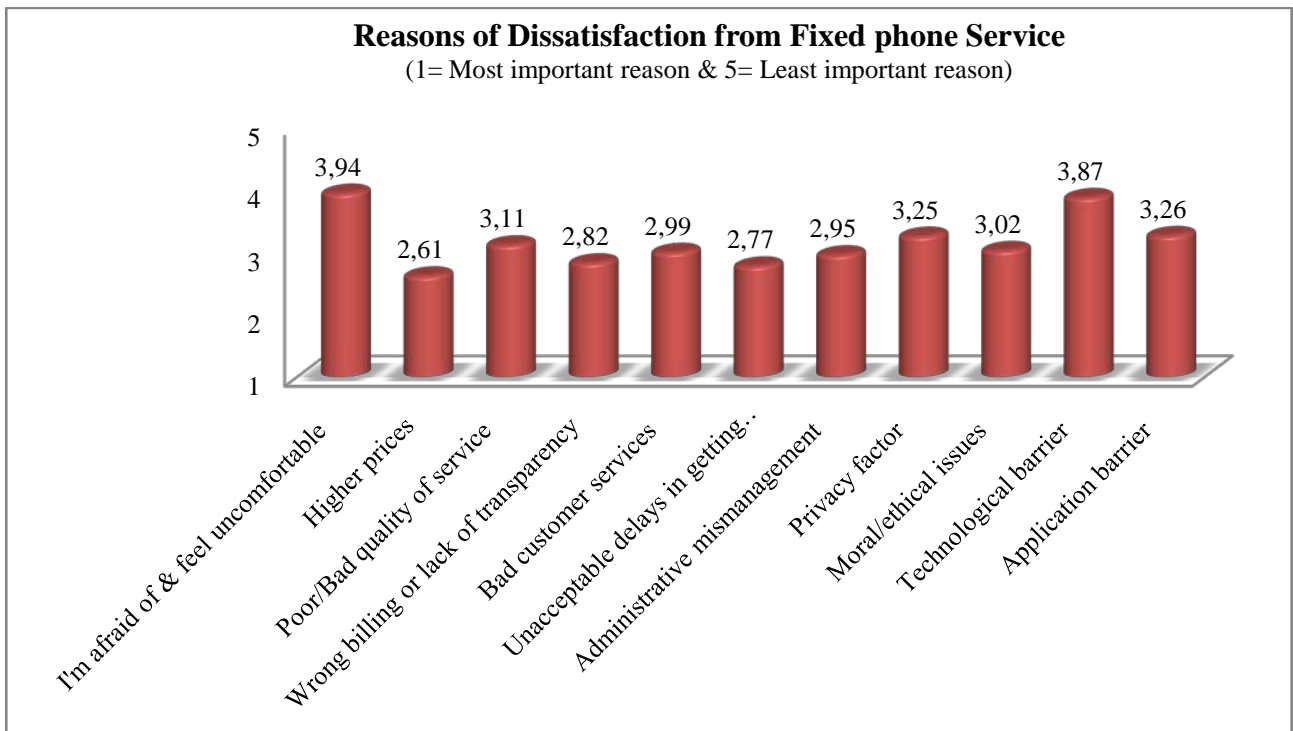


Graph 14: The Common Comparable Factors - Reasons of Dissatisfaction from Different Telecom Services  
Source: Author

The following results are derived from the data collected on the Likert scale from the questionnaire. The general tendency of the respondents has been commonly observed to preferably stay in the middle of 1-5 scaling, probably to avoid going for taking the extreme positions. One more thing to remember here is the fact that the respondents didn't make the comparative scoring simultaneously to all three services; but rather they actually scored them sequentially one after another. Hence, some discrepancies may be expected to emerge during these revisions as the respondent were passing through different sections of the questionnaire (see appendix 1); hence, possibly forgetting to maintain the comparative scaling through repeatedly referring back to the previous scorings given to other services on the similar categories. Again it is worth to remind that most of the respondents were college and university students; hence expectedly more qualified than the other ordinary users currently using telecom services in the country.

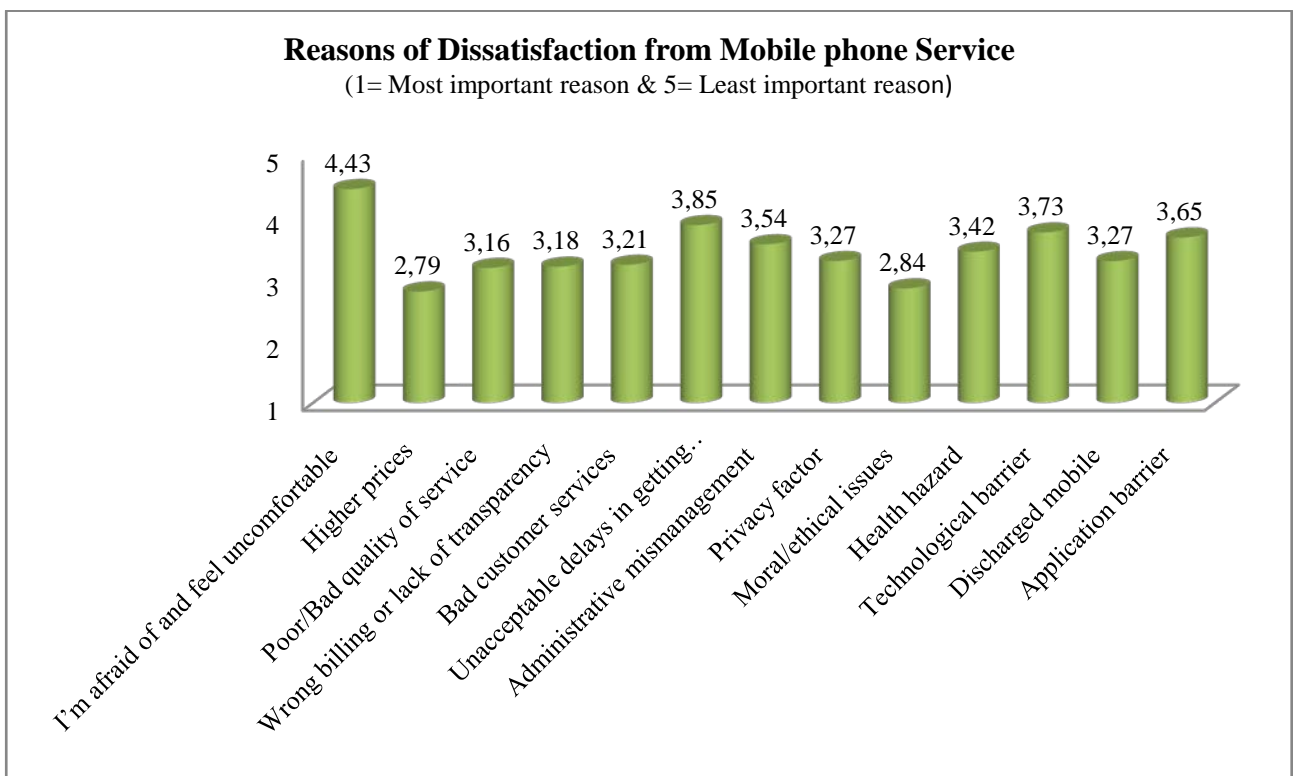
- The sampled users feel most 'comfortable and convenient' with using the mobile service in the daily usage (due to the perceived higher usability and relative comfort) when compared with the other two services; whereas, they were least comfortable with the use of fixed phone service.
- The users consider the 'prices' (service charges) paid for the fixed telephony is unjustifiably high when compared with the other two services.
- The users consider the 'QoS' of internet service at the lowest among the compared services.
- 'Wrong billing and lack of transparency' factor was ranked highest for the fixed line; whereas this issue was considered as least bothering in case of internet service.
- The 'customer services' was ranked at lowest for the fixed telephony among the three services.
- The 'unacceptable delays' in getting connection was reported highest in case of fixed telephony and lowest for the mobile service.
- 'Administrative mismanagement' was also declared highest in case of the fixed line service.
- 'Privacy' factor was considered a bit more vulnerable in case of internet services; however it was almost the same on the scale when compared with the other two telecom services.
- 'Moral issues and ethical concerns' related to the use of different telecom services were reportedly highest for the internet service, while being considered lowest for the fixed line.
- 'Technological barrier' (the relative difficulty in using a service) was reported highest for the internet, while lowest in case of the fixed line.
- The 'application barrier' (less relevance and usefulness in terms of the usage and the real need in daily life) was reported highest for the fixed telephony. The last result is understandable especially knowing the fact that mobile has in fact replaced the need for having an additional fixed phone merely for the voice communication purpose.

Let's now take a brief look over the results derived from the data for each individual graph of the three compared telecom services; in order to get some more explanations for the emerged patterns.



Graph 15: Reasons of Dissatisfaction from Fixed phone Service

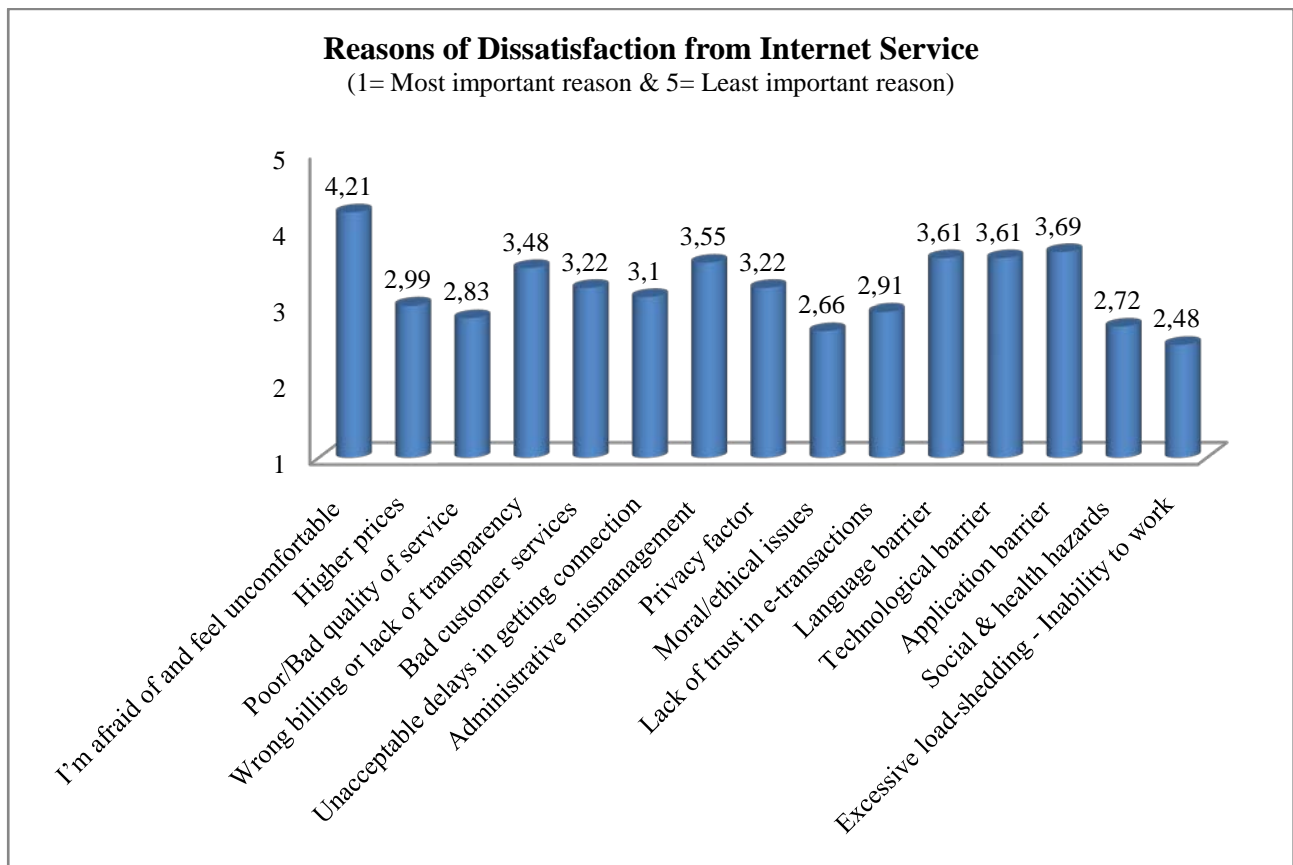
Source: Author



Graph 16: Reasons of Dissatisfaction from Mobile phone Service

Source: Author

In case of the fixed line services; the major reasons for the users' dissatisfaction have been the higher prices (including the hidden charges and excessive line rents), the procedural delays in getting new connections, lack of billing accuracy and transparency, administrative mismanagement, bad customer services and the poor quality of service (QoS) respectively. However, in case of the mobile service; the major reason for the users' dissatisfaction have been mentioned the higher prices primarily due to the hidden charges and the very high GST (General Sales Tax), moral issues, poor QoS, wrong billing, lack of billing transparency, bad customer services, privacy issues, and mobile discharging respectively in the chronological order of their importance.



Graph 17: Reasons of Dissatisfaction from Internet Service

Source: Author

Finally, in case of the internet services, the largest reason for the users' dissatisfaction has been identified the excessive load-shedding issue (i.e. the frequent and unpredictable power outage or failure for several hours a day in routine all across the country), which literally makes it impossible to persistently and uninterruptedly carry on work over the internet. This follows by the list of other major reasons of dissatisfaction such as the moral and ethical issues, social hazards (negative impacts of its excessive usage on the different aspects of life), poor or bad QoS, lack of trust on e-transaction (data security issue) and higher prices respectively in the chronological order of their importance. However, the technological and language barriers have not been considered among the major listed reasons probably due to the fact that the survey was considered among mostly the university students who were expected to be more fluent in English language, within which most of

the internet content is currently available; and also due to the fact that they are expected to be relatively more trained and used to working with computer and internet as compared to an average user of the society. Another important point to be noted here is the fact that still the internet access data rate what the students experience mostly in their campuses and at home/net café is quite low, since these connections are often delivered through the deteriorated copper lines based on DSL or dialup access solutions; and hence, they are much poorer in quality but also much cheaper in price when compared with the broadband services whose scale of diffusion is still very low. That might be one of the reasons why the respondents have ranked the ‘poor QoS’ at the highest, while keeping the ‘higher prices’ at the lowest among the major reasons of their dissatisfaction with the internet services, especially when compared with the other two telecom services (see graph 14).

### 5.8.2 The Descriptive (Qualitative) Analysis of the Reasons for Dissatisfaction

In the following section, the open comments passed by the respondents in the questionnaires and during the interviews have been profoundly analyzed in order to find some sort of pattern in these unstructured responses. These comments are clustered here in different categories as per their relevance; and hence they have been placed within different baskets (brackets) according to the chronological order of their frequency of repetition during the discussions. Hence the order of the following emerging categories in fact refers to the relative significance of these topics in the users’ perception with reference to their dissatisfaction with different telecom services. Interestingly, the discussed topics for all three compared services are clustered within five categories in each case.

#### Fixed Line Services

The major reasons of users’ dissatisfaction with the fixed line services have been listed up here within following five categories.

- |   |   |   |
|---|---|---|
| 1. Higher prices and excessive taxes  | } | Supplier-related & policy/regulatory issues |
| 2. Excessive line rent  |   |   |
| 3. Less usability & service relevance   | } | Service attributes – Supplier issues        |
| 4. Low portability  |   |   |
| 5. Less comfort and convenience   | } | Supplier-related and regulatory issues      |
| 6. Poor QoS and technical issues  |   |   |
| 7. Limited serving capacity & coverage  |   |   |
| 8. Bad customer service & response delay<br>(Connection & maintenance)        |   |   |
| 9. Administrative mismanagement   |   |   |
| 10. Lack of billing accuracy and transparency<br>(Hidden charges)             | } | Supplier-related & policy/regulatory issues |
| 11. Privacy related issues  |   |   |
| 12. Moral/ethical issues  | } | Supplier-related and regulatory issues      |
| 13. Lack of competition   |   |   |
| 14. Unwanted bundling of services   |   |   |
| 15. Lack of innovative services<br>(Less facilities and lacking new features) | } |   |

The users' largest concern is about the excessive service charges, tax rates and line rents of fixed line services, and they consider them out of the economic reach of around half of the population currently living under the poverty line in Pakistan. They speak in favor of the differential pricing scheme; somewhat similar to the case of electricity consumption, where the first 50 units of the consumed electricity for the household usage is normally charged at the lowest tariff in order to support the purchasing capacity of the poor segments of society with the help of such given subsidies. It has been deemed supportive to bridge the existing gap or 'digital divide' between the poor and rich segments of society that persists in terms of their differential ability to afford the usage of telecom services. Hence, in line with the users' comments, the author recommends the government to start considering the telecom services (i.e. access to the information and communication networks) among the 'basic utilities'; just like water, electricity, broadcasting and gas services, where the government is morally responsible to make them available at affordable prices to every citizen. The adoption of this policy direction would likely to ensure the availability of basic ICT services to every citizen in order to help promoting the rapid diffusion and smooth adoption of these services at the grass-root level. The prices for the fixed line and broadband services have been considered unjustifiably high in terms of the provided features and facilities and the delivered quality of services. The currently charged line rents and taxes have been also called unnecessarily high; as they consider the line rent a kind of imposed tax, since the users have to pay it no matter whether the services were actually used or not. In result of that, they rather prefer to get a mobile subscription for home which is line rent free; in order to receive the free incoming calls, while using the mobile home connection as a shared-mode communication device.

The second most important topic discussed was the increasing lack of relevance of the fixed line connection in terms of its low portability and no support to the roaming facility. Due to the fixed nature of landline services, a common perception about this service is that it is only suitable for stationary use such as at homes, offices or at shops to facilitate 'location-specific' communication needs; hence the service has been considered not that suitable for the youngsters, students, labors, farmers and all other persons who are often on-the-go; due to its inability to support their nomadic nature of communication requirements. Apart from its utility and usage factor, the fixed phone has been commonly perceived as a bit too formal and old-fashioned 'dump-box' causing unnecessary additional cost without creating any additional value in terms of the users' actual requirements, especially in the presence of mobile telephony and broadband services. It has been told that mobile and broadband actually replace the need for having this additional communication facility since most of the people consider using their mobile phone a more convenient and economical solution for their local and nation-wide communication. On the other hand, for the Long Distance International (LDI) calls, the respondents (mainly the students in this case) have been observed preferring the use of broadband supported VoIP services both for PC to PC and PC-phone/mobile communication. People now increasingly prefer to create their own personal communication spheres to maintain their privacy and service personalization through acquiring personal digital gadgets; instead of using the shared-mode services. People generally use the shared-mode fixed line services such as the fixed line connections at home/offices/shops, public booths/public call office (PCO) and at internet cafés only on the need basis. The mobile to mobile communication has been

considered more convenient and economical than engaging fixed line in between; whereas fixed line has been considered suitable only when calling to other fixed line especially within the same network for relatively better voice quality and cheaper call rates.

The third major reason mentioned by the respondents was the poor QoS that include the line disconnections due to the frequently occurred cable cuts, line noises (humming) and call interference (cross-talk from other voice calls). The users were also quite upset about the unnecessarily long response time and the unacceptable delays faced by them in receiving the maintenance and technical support from the fixed incumbent after the registration of the complaints. The service has been also called highly vulnerable to the usual storms and thunder rains. Even though the general reputation and responsiveness of the customer support service has been called significantly improved over the past years, especially in regard to the opening of new connections and making general queries; however, there are still some complaints raised by the respondents about the lack of cooperation from the operator's desk on the phone inquiries for the provision of the required and relevant information. Within the above category, the next issue raised was about the limited service coverage area and restricted accessibility. Currently, the total serving capacity of the fixed line is around 12 million in a country with a population of 180 million residents (est. 2010); hence, in that sense the whole country could be considered as underserved for the fixed line access. On the other hand, the connectivity and service accessibility conditions for rural areas are called even worst; knowing the fact that the existing landline capacity is mainly clustered within the large towns and cities. Some administrative and financial mismanagement cases have been reported by the respondents at an operational level in the services delivered by the fixed incumbent; that may potentially cause an element of distrust and dissatisfaction among the fixed line customers. However, the issue about the occasional problems with respect to the billing accuracy and transparency has not been considered a major concern; apart from some occasions where the users got frustrated about the additional charges and fines imposed to them due to the delayed payments; hence, the users wanted some flexibility and concessions from the fixed incumbent.

The next discussed issue was related to privacy and morality. The privacy issue was more focused on the users' concern about receiving the wrong/missed calls and unwanted/malicious calls. On the other hand, the moral and ethical issues include excessive and misuse of the fixed telephony, particularly for long hours by the immature kids and teenagers in socially unacceptable way; such as irrationally using the night-time packages by being engaged in long conversations in late hours, hence making others unable to use the shared line. In this situation even the caller itself feels embarrassed; and hence cannot communicate freely to enjoy its own premises and privacy.

The lack of competition and the incumbent's monopoly has also been considered as one of the reasons for the current stagnancy and decline in the landline market; in result leaving the customers with not much choices and options to choose among from. It has been told that due to the lack of competition, the monopolist doesn't feel any competitive pressure to improve its performance, overcome the current mismanagement, and to address the complaints on time; hence making their customers disappointed who then eventually prefer to quit the fixed line subscription. The

anticompetitive bundling of services has also been called an unhealthy practice for the market growth; since the customers are then tied and kept bound to buy those services as well what they actually don't require. Such product bundling may be done through bundling the cable TV, IP-TV, fixed line, mobile and internet services as part of different packages. One such package is called 'triple play' that offers TV, fixed line and internet in one offered price. These packages are most suitable when all the services are being provided on the competitive basis with the possibility for the users to quit any one of these bundled package (with the choice of 'opt-out'), without the need for still paying for the whole package. The fixed line services are called essentially lacking the innovative and value-added features and facilities. The services are requested to be made more scalable and customized, and user-driven in order to address the users' actual requirements.

It is important to notice here that from the suppliers and regulator's perspective, competition has been traditionally regarded as the cornerstone for all the market-growth related debates; however from the users' perspective, the issue related to competition has been discussed at the last place. This could possibly be due to the reason that users are often unaware of the fact, that the root cause of many of the above discussed issues (including the excessive pricing, QoS related issues, mismanagement, lack of efficiency, and the lack of innovation and variety) could actually be addressed by establishing the desired level of competition in the fixed line market. The users are primarily concerned about the resulting impact and consequences; hence, they are often not very much aware of or even interested in knowing the root-cause itself, so probably that's why they discussed the competition-related issues only marginally. It is also interesting here to observe the differences between the underlying translations led by the different domains.

### **Mobile Services**

The major reasons for the users' dissatisfaction in case of mobile services have been summed up here within the following five categories.

- |  |   |   |
|--|---|---|
| 1. Poor QoS and technical issues, coverage   | } | Supplier-related and regulatory issues  |
| 2. Bad customer service & delayed response (Connection & maintenance)                                |   |   |
| 3. Lack of billing accuracy and transparency (Lacking the user-control over billing, Hidden charges) | } | Supplier-related and regulatory issues<br>'Excessive taxes' – A policy domain issue |
| 4. Higher prices and excessive taxes   |   |   |
| 5. Offered packages with less clarifications   | } | Supplier-related & policy/regulatory issues   |
| 6. Privacy related issues  |   |   |
| 7. Moral/ethical issues  |   |   |
| 8. Social and health hazards   |   |   |
| 9. Risk to carry mobiles due to security issues  | } | Supplier-related and policy issues  |
| 10. Lack of service personalization & scalability  |   |   |
| 11. Technological barrier and usability issue  | } | Policy issues   |
| 12. Load shedding (discharged mobile)  |   |   |
| 13. Impacts of security issues on investments  |   |   |



In case of the mobile services as well, the QoS relevant issues have been most repeatedly discussed by the unsatisfied users. The major problems highlighted in this case were the users' concerns regarding the weaker signals and the 'dead spots' in urban areas, the network failure messages due to the traffic congestion, facing difficulty in making calls and experiencing dropped calls, delays in sending messages, poor quality mobile internet services, and the coverage (or network access) related issues particularly in the rural areas. The customer service response has been called unsatisfactory due to often long waiting time before the operator attends the call; moreover this waiting time also cost additional charges to the subscriber, which means that calling to customer service is not a toll free number. The operators' behavior and attitude has also been objected by many respondents. They request that the customer support team should slow down their conversational speed; since often it is hard to communicate with them, especially for an ordinary person who is not well conversant in English or Urdu languages. The respondents demand that the helpline should also facilitate users in helping them within their local languages, when asked for.

The second most discussed category was the 'higher prices' of the mobile services as perceived by the users; though initially it seems quite surprising, since the current mobile tariffs in Pakistan have been claimed by the regulator (PTA) as among the lowest in the world<sup>16</sup>. The dilemma actually resolves when one practically experiences the refilling of the additional credits in its prepaid balance; and often the user get shocked knowing the fact that about 17% of the balance has been already deducted from his account due to the imposed general sales tax (GST), and the rest of the credit goes quite fast, which makes most of the price conscious customers often surprised. The users strongly condemn the excessive amount of taxes and the hidden charges which are imposed on the telecom users. Many customers assume that the claims of the lowest tariffs in disguise of different packages as frequently offered by the competing operators are often used as a marketing tactic in order to grab the potential customers. And once they have got the new users registered to their networks, then the operators start charging them excessively on different accounts, as suspected by the users. Most of the consumers were found totally unaware of any 'complaint cell' facility being provided by the regulatory authority; either at its website or through any helpline phone service. Hence, it seems relevant to suggest the regulator to effectively use the media campaigns to make people aware of this facility, so that they could preserve their rights as telecom consumers.

The author presumes here that this doubtful gesture of the users towards their operators might be due to the fact that they have not been communicated explicitly by their operators about the terms and conditions of the subscribed packages clearly in the beginning. In result what happens that all those additional costs that incur to the customers e.g. due to the call connection charges, calling to the customer service support, calling or messaging for acquiring information about the balance left in the credit, and using many other small services (which are often considered as taken for granted) add up in the end in a large amount. Hence, the users then get frustrate and feel like being cheated due to not properly informed explicitly about all those hidden charges in the beginning. It has also been noticed that even if those required information are claimed to be already provided in the

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<sup>16</sup> <http://propakistani.pk/2009/07/27/cellular-tariff-in-pakistan-is-lowest-in-the-world-pta-chief/>  
(Accessed on 25<sup>th</sup> February, 2011)

introductory brochures of the different offered packages; then in that case either the critical parts of those information (from the users' perspective) are written too small to be read properly, or they are written in quite a vague style using too technical and cumbersome language. Hence, it apparently seems like a deliberate attempt on behalf of the operators to make things harder for the customers to understand; instead of making it simpler to understand all the given details with the help of some examples and demos. This happens despite knowing the fact that above 70% of the population is still literally illiterate and utterly unable to understand those cumbersome texts and technical details. The author suggests to the operators to conduct a 'user trial test' by randomly selecting 100 customers both from the rural areas (should compose 65% of the sample) and the urban areas (35% of the sample size) in order to conduct a survey to check out their level of understanding about the different offered packages, the listed prices, and the mentioned terms and conditions including the imposed charges and taxes on different services and accounts. It is expected that conducting such trial tests would help the operators to better evaluate the customers' perception about the tariffs, as declared by the offered packages. It is expected that it might be helpful in judging the scale of difficulties faced by the customers in understanding different parts of the advertisements and billings, in order to make them more explicit and user-friendly.

In the third place, the discussed issues were about the privacy and moral issues related to the use of mobile services. In addition to that, the impact of the currently poor law and order situation on the pattern of mobile usage has been also discussed. The users were generally found quite frustrated due to the frequently received missed or wrong calls and unwanted text messages. Most of these unwanted messages were the promotional ads as part of marketing campaigns run by different companies; and often by the network operators themselves in relation to informing about different offers and packages. Many users have to even switch off their phones to avoid this irritating experience of keep receiving such marketing calls and messages. The similar issue has been discussed in context of receiving the unwanted and malicious calls and messages from unknown numbers/persons, which are deliberately made to tease someone due to the 'number leakage'. In result of that experience, a general tendency among a large segment of users was observed to avoid disclosing their mobile numbers on their public profile; either on the phone directories or at the social networking websites. Hence, many respondents suggest for the provision of a clear regulatory guideline in this regard in order to stop such privacy violations.

Furthermore, there were some other reasons also mentioned in this regard. Some youngsters gave a funny reason for often switching off their phones to avoid their privacy being disturbed by the calls frequently received from their homes, asking them to come back home soon. More importantly, another issue was discussed about the violation of users' privacy, since many of them suspected and expressed their serious concerns regarding their calls and messages were being recorded and scrutinized by the security agencies. Knowing this fact makes them feel highly uncomfortable and insecure, especially in context of openly sharing their political views on different sensitive issues using their mobile phones. Those users were afraid of doing so due to the fear that the security agencies might punish them even by abducting and passing them through a tough trial without any court hearings. They accused the government and its security agencies for exercising these

tyrannical tools against the civilians to suppress their democratic voices and political opinions, since the government feels threatened by giving this freedom of expression to their citizens.

The next topic discussed was the moral and ethical concerns of the parents and teachers associated with the excessive or misuse of the mobile phone service by the youngsters. Some teenagers mentioned that they were simply not allowed by their parents to have a mobile phone with them just because of their concerns about its potential misuse and the possible negative impacts on their studies, which is somewhat quite similar to the case of internet as we shall discuss it in the following subsection. Many parents were also conscious about their concerns regarding the potentially waste of time and resources due to the excessive use of mobile phones by their kids, particularly when they are teenagers. Moreover, the parents were concerned about the bad calls and the immoral contents of the circulating text messages such as unethical jokes, which they didn't want their kids to be exposed to. Finally, a concern has been shown that mobiles are now increasingly being used for committing or facilitating the criminal acts; however, it remains primarily the role of the regulatory authority, security agencies and operators to become more vigilant to curtail any such possible use of the mobile phones for those illegal & criminal activities.

On the social hazards of the extensive usage of mobile phones, the respondents did also mention their concerns; saying that people often get lost and stuck with using their mobiles, while largely ignoring the people in their immediate vicinity and surroundings that may cause to affect the social bonding and the family ties as well. They further explain that often it gives quite awkward feeling and sometimes causing embarrassment, while talking to someone and in the meanwhile facing continuous problems of dropping calls and unheard voice due to the signaling problem at different places. In result of these technical problems in communications, sometimes it may even create serious confusion and frustration among the communicating parties to properly understand each other's point of view, especially when compared with the situation of face to face meetings. Secondly, talking to someone on the phone doesn't involve any personal touch, as we experience in case of having face to face interactions, since there is only talking or messaging possibility that allows us to communicate at a distance; which severely lacks the emotional touch and a clear interpersonal communication to avoid any sort of confusion in between. On the health hazard issues, in relation to the extensive use of the mobile phones; surprisingly, no one did show any concerns e.g. the potentially negative effects of the emitted radiations or the radio waves on the brain or hearing impairment. The author presumes that it may be due to the fact that the users are generally not made aware of those potentially negative impacts of the excessive use of mobile phones through media campaigns or other information sources; the way these topics have been raised and actively debated in the technologically advanced and socially welfare countries.

Finally, the last discussed topic in this category was about the security threats faced by the mobile users while using their gadgets in the public places, due to the worsening law and order situation in the country. The users mention that their mobiles can be easily stolen, or even snatched by someone at the gunpoint; as these incidents have been frequently reported, resulting in many casualties. Hence, often it is considered highly risky to carry expensive mobile handsets in the pockets while

walking in crowded places; such as shopping in the markets in rush hours or queuing somewhere. On the contrary, due to the worsening security conditions; there is also an opposing trend observed to be taking place, where surprisingly many parents have been seen now convinced to provide mobiles to their kids in order to remain in touch with them at the time of emergency or any mishap.

The fourth category was related with the relevance of mobile phones in connection with the technological barriers and usability issues which they face in using their mobile phones effectively. In terms of relevance, mobile users seem to be more satisfied than having any dissatisfaction. Most of the users were highly grateful for the convenience and facilitation the use of mobile phones had brought to their life. They consider that through being connected with the world actually helped them remarkably in saving their time, which they can spend now on other productive stuff. The high portability and omnipresence of mobile service keeps them connected with anyone, anywhere and at any time. They primarily use mobile phone for personal communication. They consider that they will be out of contact with their families and friends without having mobile service. They consider mobile phone much better than fixed phone due to its portability but inferior than fixed in the available voice quality. Users also prefer mobile due to its accessibility, low cost, user-specific and trendy features. Users generally consider mobile a quick and reliable service for communication especially at times of emergency and sending multiple invitations or sharing news.

However, in terms of service personalization, the mobile users show their concerns about the limited possibility for personalizing the mobile service as per their requirements. Nevertheless, the author notices that some of the recently introduced offers from a couple of cellular operators are actually targeted at addressing this issue to some extent. The users also articulated about facing usage difficulties (technological barriers) in the effective and optimal utilization of their mobile phones and the subscribed services. The users consider that the offered packages are often predefined by the operators due to product bundling; hence, leaving less opportunity for the users to self-design the desired features of the subscribed services, as per their own requirements and specific context of usage. This issue actually reflects lacking of personalization and scalability in the delivered service. Apart from that, it was also discovered that most of the users actually didn't understand the use of different features and applications available on their mobile phones; and they were rather afraid of trying different functions and the available features on their mobile phones out of the fear that they might damage their handsets. The author's general observation also reflect that in fact, most of the users only knew about how to receive and make the calls, or at the maximum how to send and receive text messages.

Finally, the last mentioned category highlights a couple of macroeconomic issues relevant to the policy domain that marginally make part of the users' concerns over the effective adoption of mobile services. One of the issues was the excessive and frequent load shedding problem in the country; however, in opposite to the case of internet, the mobile users were not that much concerned about that issue, since they considered the issue was manageable as far as it was all about the charging of the handset. Interestingly, the above response from the user domain about the load shedding effect on the pattern of their mobile usage seems to be apparently quite opposite to the

mounting concerns of the supplier domain (see chapter 8) about the load-shedding effect over their businesses and their capability of delivering an efficient and cost-effective mobile service to the consumers. Furthermore, the users were also not that much concerned about the negative impacts of the bad security conditions on the foreign investment; since they were only concerned with those issues, which were thought to be directly relevant to them. Again on the contrary, the security issues and their impacts on the suppliers' business and the foreign investments stand first among the operators' list of concerns. In all these cases; it is apparent to see how the translations made by the different stakeholders on the conflicting issues considerably vary as per the involvement of their specific interests.

### **Internet Services**

The discussed topics in relation to the users' dissatisfaction with the internet services are again classified here within five major categories as per their importance in the users' perception; in the chronological order according to the frequency of repetition of the discussed topics.

- |   |   |   |
|---|---|---|
| 1. Moral and ethical issues   | } | Supplier-related & policy/regulatory issues |
| 2. Social and health Hazards  |   |   |
| 3. Privacy issues (social barriers & restrictions)                      |   |   |
| 4. Restricted freedom of speech   |   |   |
| 5. Poor QoS, technical issues, slow data rate                           | } | Supplier-related and regulatory issues      |
| 6. Data and service security<br>(Lack of trust on e-transaction)        |   |   |
| 7. Higher prices  | } | Supplier-related & policy/regulatory issues |
| 8. Excessive load-shedding  |   |   |
| 9. Lacking relevance<br>(Local contents, personalization & scalability) | } | Supplier-related and policy issues          |
| 10. Technological barriers and usability issues                         |   |   |
| 11. Lack of innovative services   | } | Supplier-related & policy/regulatory issues |
| 12. Coverage issues (accessibility)                                     |   |   |
| 13. Low literacy rate (language barrier)                                |   |   |

The respondents overwhelmingly showed their concerns about the potential negative impacts of the misuse of internet on the social and moral values of the society. Explaining the case, they mention the fact that often nude pictures, and links to filthy sites and morally corrupt contents appear on the screen (such as in form of 'web-ads' or the side banners) even while retrieving quite irrelevant information, which is called to have negative effects on their focus at work. They further mention that due to the presence of this filthy stuff on the internet, they often don't dare to use it in front of their family members, especially when the user is not familiar how to block such contents popping up on the screen suddenly. Parents have been called a major barricade on the internet usage at home due to their severe social and moral concerns and restrictions over its excessive or misuse, in order to protect the family values. Even if allowed at home, they often try to monitor its usage and resist their kids using it for longer periods of time, as they consider it potentially a waste of time and resources. The parents want the vulgar and filthy websites to be blocked immediately, since they

consider that in the young age, internet may divert their kids' attention from their studies and other healthy activities towards more distracting and morally bad practices. Hence the parents generally consider the internet as a medium that proliferates morally bad contents and socially unacceptable practices, which may spoil their kids. Whereas, many students and youngsters consider that the prevailing unawareness among the parents about the positive use and beneficial applications of the internet could be the main reason for the parents' conservative and antagonistic attitude towards this technology. The author presumes that a bad impression of the internet services has been proliferated in the society due to the predominantly its misuse, particularly among the youngsters; instead of effectively projecting its range of other useful applications in the society. In short, it is argued that internet is itself a very useful technology but its misuse has to be checked and controlled by the operators along with the support of the family, academic and regulatory institutions. In parallel, there is also a need to educate people by making them aware of its positive and productive use in order to improve the common image of the internet in society.

The users consider that apart from the social and moral hazards, there may also be some health-related issues faced by the users in result of an excessive use of the internet; including the shoulder, back, wrist and neck pains, and the problems associated with the eyesight and mental distraction (i.e. the lack of focus). Moreover, the commonly observed laziness attitude towards physical work and the gradually diminishing physical sports activities could also be the reflections of its potentially negative impacts. It has been argued that the currently experienced 'information explosion' phenomenon on internet may potentially become a major cause for the time waste, if the search on internet for relevant information is not kept targeted and focused on the assignment in-hand. Operating internet itself becomes a time consuming activity, especially when browsing several pages and downloading large volume of stuff has to be done on a slow internet connection, which is often the case even within the academic institutions. It has been also considered becoming increasingly a threat for sustaining the cultural tradition of personal or physical meetings due to the fact that internet makes us too occupied and lazy to have any energy or time left for personally visiting others to meet them, even at the occasions of greetings or to pay condolences.

From the security and privacy perspective, many people now consider it risky to share the personal information and family photos through mobile or on the internet due to its potential misuse by eavesdroppers and intruders. Also in this context, sharing of the political views on the phone or using internet is also now commonly considered unsafe; especially in the authoritarian and suppressive regimes, out of the fear that their communications would have been supervised by some infiltrators using the data filtering process, which the users consider a serious violation of their basic civil rights to have the 'freedom of speech and expression'. Recently the government has taken action against many news channels and websites which were creating political anarchy in the country, from the government's perspective; since they were sharply criticizing on the government policies. Many respondents raise their voices in favor of the abolishment of such restrictions on these news channels and websites immediately; in order to ensure the 'freedom of expression' and the free access to the information sources. They consider that the political views of the general public opinion can't be suppressed in the name of national security. They insist on assuring the

liberty and the freedom of speech and expression, since it should be the genuine spirit of any democratic state.

The second major issue discussed by the respondents was about the poor QoS that included the very low speed in case of using narrowband (often less than 30 kbps), and the issue of weak signal strength and the fluctuating data rate in case of the broadband wireless services. The users complain about a great degree of mismatch between the promised and actually delivered data rate, especially in case of the broadband wireless services. The Internet security has also been questioned since people are afraid of the risk that their systems may get corrupt from a very large number of viruses spread in the cyber world. On the other hand, the licensed versions of the anti-virus programs have been called quite expensive; hence they propose these antivirus programs to be distributed free of cost by the service providers (ISPs) as an additional 'value-added service'. The internet is required to be made completely secure for the online transactions including the e-banking and e-commerce applications; in order to encourage the users to make an effective use of different internet applications more frequently and safely, with also an automatic backup support facility in case of any data loss e.g. in result of an interruption due to the power failure (load shedding).

The issue of higher prices has been discussed on the third place. It may be due to the fact that the prices of the modem-based dialup internet connection is already quite low; but the quality of that service is also very pathetic due to the extremely low speed and continuous connection breakdowns even during a single session of work. Some users even suspect that the fixed incumbent (who actually controls the provision of dialup and DSL based internet access provision in Pakistan) deliberately make these frequent disconnections in the dialup service in order to put additional cost on the dialup users for making these connection calls each time when the connection breaks. On the other hand, the current prices of the broadband services have been considered quite expensive from a common men's perspective knowing their very low purchasing power in terms of GDP/capita (PPP). Furthermore, it has been informed that internet users are badly affected by the excessive amount of unpredictable load shedding in the country for long hours throughout the day. The load-shedding problem has been counted among the major reasons that severely discourage the users to conveniently make use of internet due to these continuous and random load-shedding, which breaks the working tempo and creates much disturbance.

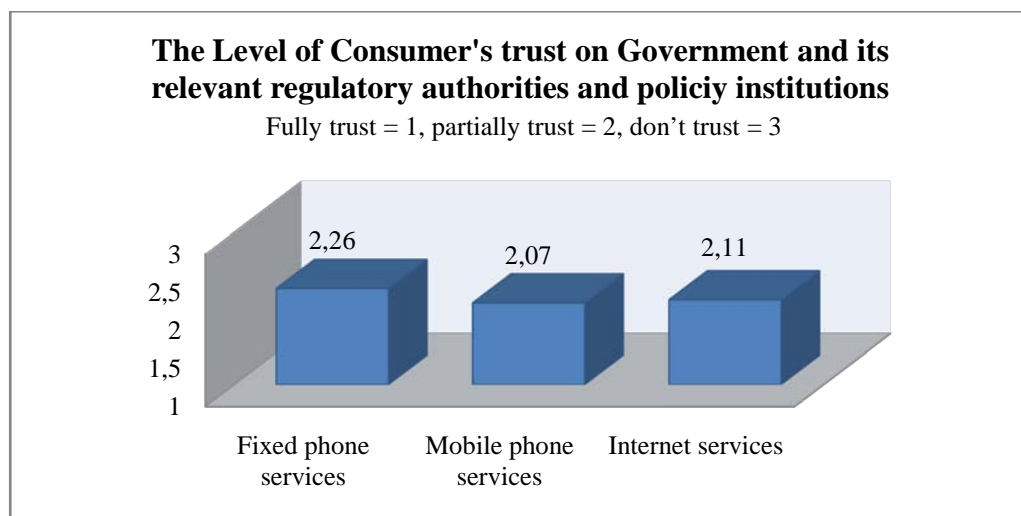
The users consider that the available technologies need to be further developed and for that the suppliers need to introduce more innovative services, suitable for the local context. The author presumes that to get more innovative, the suppliers would need to get connected with the sources of innovation i.e. the different 'centers of excellence' located around the world; in order to get better aware of the new emerging trends and innovations for the swift adoption. The customer doesn't consider the currently delivered services and different internet applications fully in line and relevant with the user's actual needs and requirements. In this regard, the users ask for an increased service personalization, scalability and the development of relevant contents and applications. They also consider the common users' inability to effectively make use of different applications on the

internet as among the major reasons for their lack of interest in further exploring the range of possibilities and opportunities that exist in the productive use of this technology.

Finally, the users briefly mention their concerns about the limited internet access, especially in the rural areas due to the excessive incurring costs in the network deployment in those far flung areas. They also acknowledge the poor business case of access provision to the rural areas. They recognize the absence of the required demand and the purchasing power among those rural communities, which make the suppliers hesitant in rolling out their networks in those areas. The lower demand has been attributed primarily to the very low literacy rate within those rural communities.

### 5.9 Level of Consumers' Trust on the Government & Regulatory Authority

Finally, the users of the telecom services were asked to scale the level of trust they have on the government and its relevant authorities that compose together the 'policy & regulatory domain'; with reference to its effectiveness in playing the role of 'guardian' for the consumers in order to protect their consumer rights, and assuring the availability of good quality services at affordable prices whole across the country. The following graph clearly shows the consumers' high scale of distrust on the government, and its policy & regulatory institutions. In all three cases, the scale remains in between the levels of 'partial trust' and 'no trust', which should be clearly an alarming signal for the policy and regulatory domains, in relation to the assessment of their performance.



Graph 18: Level of consumer trust on the government and regulatory authority

Source: Author

Among the three services, the 'highest level of distrust' does exist in case of the fixed line services, followed by the internet services. However, in case of the mobile services, there has been relatively a better image for the policy and regulatory domains in the consumers' perception. The government, and its policy & regulatory bodies were asked by the users to play a more proactive and leading role in establishing competition in fixed line and internet markets, and also in the provision of good QoS at affordable prices to effectively meet the challenges of the universal service obligations (USO).



### **Concluding Remarks**

From the above comparative analysis of the three cases of telecom services, it is obvious that most of the concerns and the reasons of dissatisfactions raised by the users were primarily related to the supplier domain; and followed by that with the policy and regulatory domains. The author here presumes that in fact, the users only see the front players who directly interface with them such as the telecom suppliers i.e. the telecom operators and service providers; whereas everything else that goes above the supplier domain are commonly assumed by the users to be addressed by the government. Hence, that's where the significance of engaging the expert opinions from the industry becomes obvious, since they have rather much broader horizon to look at these issues more in-depth. On the contrary, often the common telecom users are either unable to understand the depth of the issues; or they are unable to properly articulate their concerns, due to having comparatively less capability and competence to effectively grasp these wide-ranging issues in their full complexity.

## **5.10 The Users' Recommendations**

The following section presents the users' recommendations for the telecom suppliers, and the policy and regulatory institutions. These recommendations basically aim at the rapid growth (in terms of access provision and increased teledensity) and an effective diffusion (in terms of the resulting impacts) of the compared telecom services in Pakistan. However, the lists of recommendations for the policy and regulatory domains have been combined here together for the sake of simplicity at this stage of analysis; due to the fact that the users often can't clearly make the difference between the operational boundaries of the policy and regulatory domains. Hence, as per the users' perception; anything that goes above the supplier's mandate is often considered the job of 'government' (that actually includes both the policy and regulatory domains) to tackle with those issues. Nevertheless, the issues raised by the users and a wider range of other relevant topics would be further debated and thoroughly revised in the forthcoming chapters separately as per their relevance to each domain, in the light of literature review and industrial expert opinions. The following lists of recommendations have been placed in the chronological order of their repetitive frequency as per the users' responses.

### **5.10.1 The Users' Recommendations for the Policy & Regulatory Domains**

This section presents a detailed account on the users' perspectives on different issues deemed relevant to the policy and regulatory domains in relation to the rapid and smooth diffusion of telecom services; and accordingly their recommendations for the respective domains.

#### **Tax Reduction**

It has been unanimously insisted by the users that government should immediately withdraw or at least substantially curtail the currently imposed high scale of taxes on telecom services. The government should rather facilitate the common man (living with restricted buying capacity) to have access to these services at affordable rates. The users consider the currently imposed high tax rates as a cruel gesture of the government towards its public; hence, they recommend these taxes should not exceed above 3 to 4% at the maximum (which is currently at 17% in form of GST), if the government wants the public's interest remains intact with their government. The users also reckon the fact that the high tax rates imposed on the suppliers are also often passed on the users

through increased prices and hidden charges; hence, there again the users eventually suffer. It has been told that without making these services available within the economic reach of a common man, it is literally impossible to promote the telecom sector and realize the rapid diffusion of telecom services. Hence, the possibility for a common man to have access to all basic telecom services at an affordable rate has been called a critical factor for the faster social and economic development of the society in today's information-led economy. The operators also oppose these excessive governmental taxes, while highlighting the same line of argument as passed by the users. Here we can clearly see how the interest alignment takes place between the user and supplier domains as they speak on behalf of each other, like a spokesperson at occasions; in order to raise their voice to put further pressure on the government for their common benefits.

### ***Proactive, Facilitating and Vigilant Role of Policy & Regulatory Domains***

The users demand a more proactive, facilitating and leading role on behalf of the policy & regulatory institutions, and ask them to become more vigilant upon the business activities and practices of telecom operators; moreover, the resulting impacts on the consumer markets. They recommend for setting up a mechanism to properly monitor the operator's compliance with the set rules, procedures and obligations as outlined within the policy and regulatory frameworks. This is important to ensure that all service providers abide by the rules and obligations on equal footings. In parallel to that, there should be an increased cooperation and facilitation from the government with the telecom operators; in order to encourage them to further deploy resources for the growth of telecom sector through developing telecom infrastructure whole across the country, in the presence of favorable conditions and supportive business environment. Government has been asked to take genuine interest in the development of telecom sector through actively engaging on merit with all the stakeholders, whose interests are associated with the growth of telecom sector in the country. In addition to that the government should also check the performance of its subordinate policy and regulatory institutions through setting up clear milestones for their relative achievements using the comparative benchmarks of 'best practices', as commonly observed in the developed countries.

The government has also been asked for facilitating the 'awareness campaigns' (i.e. the avenues and occasions of learning) to be effectively run among the masses for promoting the relevant and productive use of ICT services. Hence, the motto for the policy & regulatory domains should be the facilitation and encouragement of both the suppliers and consumers for the rapid supply and effective adoption of telecom services. The users appreciate a good working relationship and mutual collaboration among the major domains of the telecom sector with the proper facilitation of government. The author also presumes that a well-adopted mechanism for the effective monitoring of the efficiency level and performance of telecom operators, policy makers and regulators might help in building the consumers' trust on the government; hence, resulting in the rapid and smooth adoption of telecom services accordingly.

The users are also worried about the inefficient market entries by incompetent telecom suppliers who are unable to provide telecom services efficiently. The users ask the government to maintain a strict check and observation over the inefficient telecom suppliers (including both the vendors and

service providers). It has been considered the government's prime duty to ensure that the public gets the promised and desired quality of service in return of the money they spend over subscribing those services. It has been further insisted that the regulator should more effectively check the QoS, mismanagement and the network related problems (such as slow data rate, weak signal strength including the coverage and interference issues, poor customer service and technical support, lack of billing transparency and administrative mismanagement issues); which are the main reasons for the users' dissatisfaction with the telecom operators and their delivered services. The regulator should make sure that if a complaint is filed against an operator's poor QoS regarding call drop/weak signal, line distortion/interference or delayed response (issues regarding customer support), then it shouldn't be repeated. In line with the above recommendations, the author suggests that the previously registered complaints should also be checked randomly at regular intervals in order to observe the 'response time' (i.e. the interval between the 'fault occurrence and clearance'), the probability of 'fault reoccurrence', and the customers' level of satisfaction with their different operators and the subscribed services.

### *An Effective Price Regulation*

The overwhelming majority of the users consider the current tariffs of telecom services very high, especially in case of the fixed line and broadband services; when compared with the purchasing power and economic reach of a common man. They demand from the government to ask telecom suppliers bring their prices down in order to make these services affordable for an average consumer. The presence of a vigilant 'price regulatory regime' has been desired, which could restrict the anti-competitive rents received by some operators through enforcing an effective 'price-capping' over the ceiling price (maximum charged value). They hope that such a 'price control' regime would curtail the anti-competitive pricing practices, including the price pre-adjustments by market collusions. Furthermore, they also expect that such a regime would eliminate the unnecessarily higher amount of taxes, excessive line rents and hidden charges, which have been imposed upon the telecom markets.

The author finds it interesting to see how the concept of 'price-capping' has been differently translated here by the user and the supplier domains respectively. For example, the relatively small service providers and operators favor the price capping, but they only insist upon capping over the 'floor prices' i.e. to set a base price for the lowest charged amount. That is basically to enjoy the excessive rents in the absence of capping over the 'ceiling price', and to also avoid any anti-competitive maneuvers from the incumbent or the large operators aimed at ousting the small players from the market through 'cross-subsidizing' or exercising the other anticompetitive practices such as 'predatory pricing' and 'vertical price squeezing' due to their control over the 'essential facilities' and the total 'value chain'. On the contrary, the users are only interested in the price-capping from the 'ceiling price' perspective; since the absence of capping over the 'floor prices' essentially benefits the users in terms of getting the services at the lowest prices possible, in result of the fierce price competition among the competitive suppliers, as we currently observe in case of the cellular market in Pakistan.

The users demand for an increased billing accuracy and transparency. They ask for explicitly disclosing all the unclear or unexplained hidden charges in the delivered bill; so that the consumers could see the cost breakdown in detail, with the applied terms and conditions for each subscribed package. The users realize the need for an explicit policy for those offered packages; in order to strictly check the potential risk of 'deceptive marketing' by the operators and service providers. The regulatory domain has been asked to be vigilant about such packages, which are potentially confusing and tricky, and sometimes even bluff the customers. It is further stated that the operators should be forced to explicitly reveal all sort of previously undeclared and hidden charges in their advertisements as well. In this connection, the author presumes the collaborative role of the sector regulator (PTA) and the competition regulator (CCP) as crucially important in order to ensure transparency, fair competition and consumers' protection in the telecom market.

### ***Addressing the Elements of Distrust, Lack of Transparency and Political Instability***

There has been a common cry among the consumers about the dishonesty and lack of transparency that largely prevails particularly in the public sector, resulting in a noticeable degree of dissatisfaction and distrust of the consumers upon the government. They ask government and other public institutions to become honest, dedicated and loyal to the people. They insist that the policy and regulatory institutions shouldn't accept any unjust influence or intrusion from any public or private entity; and the decisions should be made purely on the basis of merit, while strictly following a fair and transparent mechanism. They consider that the biggest problem in the country has been remained the lack of trust and transparency, the prevailing high scale of corruption and dishonesty, and the absence of a competent leadership and good governance. The users demand for the eradication of the corrupt and nontransparent policies, which are tailored to protect the vested interests of particular powerful groups; instead of keeping in mind the public's interest at the first place. The users ask the government to change its policies in line with the national interests, which should always supersede and rule over the personal and vested interests of different individuals and the influential groups. They also reckon the existing political instability and administrative inefficiency among the major bottlenecks in the development of telecom projects, since these factors considerably delay these projects from being successfully completed on time. It has been further said that the inconsistently adopted policies due to the frequent changes in the political setup leads towards the initiation of politically motivated projects and also the inconclusive abolishment of many yet incomplete projects; resulting in considerably large waste of resources.

### ***Protecting Privacy, Freedom of Speech and Consumer Rights & Ensuring Data Security***

The consumers demand for the protection of their privacy during the use of ICT services. Many users have shown their high concerns about the potential risk of the violation of their privacy, out of the fear that their exchanged data (emails, text messages, chat) and the voice calls may have been regularly monitored by someone. Hence, keeping the above fact in mind, many of them feel quite reserved and uncomfortable while talking to someone on politically motivated debates or at some sensitive issues; and they rather prefer to avoid sharing their political opinions on such issues. They mention that at occasions they become very conscious in making the selection for the proper words in order to express their point of view; hence, they do not freely enjoy the 'freedom of expression' while communicating on the phone or using internet. On the other hand, some users were found not

that much concerned on this issue as they believed that they didn't have to worry about anything, if they were not guilty.

However, in the case of privacy, there is no clear alignment seen among the three domains, since the users generally want their privacy should be completely protected against any such attempt of traffic monitoring; either from the supplier & regulatory domains, or by any third party such as the security and law enforcement agencies. In this particular case, the supplier itself doesn't benefit at all with the traffic monitoring practice; due to considering it an extra obligation that consume significant resources on behalf of the supplier without gaining any commercial benefit out of it, and also to avoid creating any conflict with its customers. However, the operators are then probably asked by the regulator or by some other security agencies to enforce such traffic monitoring mechanism, often in the name of national security. In this case the supplier domain has to abide by the government's provided instructions, with no choice to deny; since it is positioned as a buffer or interface between the regulator and telecom users. Furthermore, there was also commonly an element of fear as observed among the users, when it is about sharing their personal data (such as the credit card information) on the phone or at internet, since they are afraid of their personal information being leaked out to some 'intruder' (or 'eavesdropper'), who may attempt to use it for stealing money, or possibly committing a fraudulent or criminal act. Hence, the users demand for strict policy measures in order to effectively check over such incidents.

On the issue of consumer rights, again the users demand for a clear policy framework that should be effectively enforced by the regulator, so that the suppliers couldn't violate any clause or the fundamental spirit of an explicitly specified and detailed 'consumer protection law'. The regulatory authority has been asked to actively investigate the consumer issues in order to decisively resolve those issues. The government policies should be lenient towards the public's benefit with the aim to provide more incentives to the users. The regulator has been asked to effectively protect the consumer rights by saving them from being exploited by the suppliers. On that issue, the author principally observes a clear alignment between the users, policy and the regulatory domains. The users further ask the policy and regulatory domains to truly represent them by standing firm to protect the consumer rights, as acting like their guardian to let them aware of the actual facts. They also ask the government to amend its licensing policy by adopting new provisions in the licensing agreement that could bind the telecom suppliers to properly take care of the consumers' rights; and which could hold them accountable for the range of issues relevant to the public's health and social concerns, as it should have been declared in the proposed comprehensively drafted 'consumer protection law'. The users acknowledge the regulator's initiative of establishing the 'consumer's complaint cell', where they can register their complaints about the mobile operators. However, they recommend an extended operational mandate for this 'complaint cell' to also effectively take care of the consumers' registered complaints against the fixed line and broadband operators. The users want the regulatory authority to establish a 'help-desk' (using both a toll-free hotline but also an online service on its website) with prompt and time-bound responsiveness in order to facilitate and expedite the complaint handling process.

The users expect an empowered and much stronger role on behalf of the ‘consumer groups’. The role of consumer groups has been briefly discussed in the forthcoming section 5.12 in the local context. The consumer groups are expected to vigilantly take care of the consumer rights while acting as their ‘spokesperson’ or the ‘translator’ in front of the suppliers and the policy and regulatory domains; in order to actively protect the consumers’ interests and defend their rights. In this regard, the author suggests that these consumer groups should also be given the mandate to check any consumer complaints against the telecom vendors and operators who are either providing telecom services or supplying telecom equipments such as handsets, user terminals or other ‘customer premises equipments’ (CPE); either in case if they were providing degraded services or selling defected products, or the suppliers were not properly taking care of the product’s warrantee and the after-sales services.

In this connection, the author suggests the idea of the availability of physical outlets in addition to the ‘virtual outlets’ (online shops), as considering it a way to raise the consumers’ confidence over the e-commerce business model. It is considered important particularly in case of claiming against any defected product (either for the replacement or receiving a time-bound technical support); and also in case of showing ‘regret’ to withdraw from any subscribed service or the purchased product within the mentioned time, as per the stated terms and conditions. Hence, the government should encourage the individual entrepreneurs and private businesses to adopt the emerging e-commerce model into their business operations. In this context, these businesses and shops can play a critical role in promoting e-commerce applications if they offer the option of purchasing the goods on their ‘online shops’ at discounted rates in addition to a safe and on-time ‘home delivery’ option, as compared to the traditional mode of purchasing from their physical outlets. This model would suit the shopkeepers and vendors as well, since they may save the rental cost of the expensive outlets, which are required in order to keep those products all the time on display or in stock for an immediate access. The online business model is expected to have an increased value for the shopkeepers and traders, especially when considering the ongoing severe power shortage (load shedding) problem in the country; in addition to the financial losses that occur due to the new law that compels them to close down their businesses in late evening hours in order to save electricity.

#### ***Addressing the Moral & Social Issues Associated with the Use of ICT services***

The users comment that due to the lack of education and awareness among the masses, there has been commonly observed an unproductive use of telecom facilities. They ask the policy & regulatory domains to check over the increasingly misuse of telecom services for the undesired purposes, which may have negative consequences particularly in case of the youngsters and students. They demand the enforcement of an effective law in order to check upon the morally and socially undesirable contents and applications currently available on internet, and to also curtail the reception of malicious calls and text messages on mobile and landline phones. It has been called the collective obligation of the policy & regulatory domains to facilitate creating a favorable environment for the purposeful and effective use of telecom services. The general public is required to be educated and made aware of different useful applications of ICT services; hence it refers

towards the need for 'social reform' that could bring about a positive change in the social attitude of the general public towards the productive use of these services.

It has been told that one major retarding factor in case of the internet diffusion is its overwhelmingly negative perception (image) that prevails in the general public's mindset. A vast majority of uninformed population simply view internet as a communication and broadcasting platform that has been essentially used for spreading morally unacceptable contents, and for the time-unbound chatting and browsing purposes; hence internet has been generally perceived as a major reason for the waste of time and resources. It was mentioned that in the newspapers and weekly magazines, there are found to be reserved columns and sections just dedicated for publishing 'internet gossips and stories'; and these stories often revolve around similar themes that how internet can be or has been used for the flirting and dating purposes using incidental and random contacts; and even sometimes with 'fake identities'. However, socially such practices are commonly considered as contradicting with the traditional cultural values of the country, since these practices substantially depart from the conventionally set protocols used for being introduced to someone or sending a marriage proposal. Hence, when such contradictory and negative image of the internet usage will be proliferated by print and electronic media, then how come one can expect that the elders would ever trust this communication medium to be introduced in their homes to let it erode their deep-rooted social and cultural values?

Also in case of the academic institutions, the network and data administrators try to put restrictions on internet usage for irrelevant applications, at least within the university premises following the academic policy of the institute through installing 'proxy servers' to control over such contents and applications on internet within the academic premises. However, the students disclose that most of them already know the 'tricks' how to sneak out of these restrictions. Giving another example regarding the image problem, the author himself observes that; if a school boy in Pakistan goes to an internet café then it is generally presumed that he must be watching some bad content over there. The typical image of net cafés in Pakistan is a 'disliked place' especially from the parental mindset. Generally the net cafés are composed of dark rooms with poor desktops, where two or three guys are often found sitting within one congested cabin in front of a single screen. This typical image of internet particularly warns the parents to strictly control and supervise the internet use by their kids, even outside the home as well. Hence, the author suggests that the positive, effective and relevant use of internet should be properly highlighted through media campaigns; so that the parents could be convinced to adopt this service with a positive spirit, and to let their kids use internet at home and outside unrestrictedly. However, the change of opinion and the adoption process is deemed to be a gradual process, which should not be assumed taking place with an immediate or drastic effect.

On this topic the parents share their point of view saying that; as an adult individual, they are not concerned about the presence of morally bad contents on TV or web, since it is a very personal choice for every individual to decide for what purpose one wants to use the different communication mediums. However, its usage among the family members particularly in the presence of immature kids makes them highly worried and concerned due to the fear that it may



possibly have negative consequences for their kids in terms of their social and moral character. Hence, they suggest two propositions to deal with this situation. The first choice is to straightforwardly block those websites at home, which are publishing or streaming bad contents; but then they also acknowledge the fact that the kids may get exposed to those undesired contents and applications anywhere else due to their naturally aroused curiosity about the forbidden stuff. Hence, this proposal may fully get an effect if implemented at the state level by the government. On the other hand, the second choice is to have a productive and healthy dialogue with the kids in order to educate them in a friendly environment about the positive and proper use of internet and other ICT services. Apart from the moral aspects, many parents are also concerned about the possibly negative side-effects of the extensive use of mobile and internet from the health and social hazards' perspective. These concerns include matters like too much exposure to machines may consequently lead to a diminishing scale of interpersonal social interactions; in addition to their worries about the other side-effects of the excessive use of these services such as the suspected effects on the brain, eyesight & audibility, or upon the physical growth due to the decreasing level of sporting activities.

In this regard, the telecom regulator is required to check over the morally bad contents (unmatched with the social and ethical values) that are circulated, published or broadcasted through mobile, internet and radio/TV broadcasting. Hence, it requires good collaboration between the telecom regulator and the electronic broadcasting regulator (called PEMRA<sup>17</sup> in Pakistan). It is because if the broadcasting and telecom regulators won't collaborate on that, they would have serious issues in future; considering the fact that now increasingly most of the broadcasted contents whether on TV or through internet are often rebroadcasted through the other communication channels as well. Therefore, a similar and harmonious 'contents regulation' is required to be emplaced for all the broadcasting mediums in order to ensure an effective regulatory regime. The users ask the regulator to be vigilant in order to effectively block those sites which are publishing or streaming such morally undesirable contents. It has been suggested that after taking such measures and effectively enforcing the new regulation, the regulator should run a mass campaign along with the telecom suppliers in order to convince the conscious 'opinion leaders' of society (e.g. parents & teachers) that they shouldn't be worrying any more about the misuse of ICT services, such as in case of the availability of unethical contents over internet & should rather help in promoting its productive use in the society.

### ***Policy Reviews & their Effective Implementation***

The users comment that government should make correct and effective policies in favor of end-users and the local industry. They ask the policy institution to review telecom policies and take into consideration the recommendations made by the users and telecom industry. The telecom policies should be focused on one point agenda; and that should be the growth of telecom sector by the optimal allocation and effective utilization of the available resources, in consensus with all the major stakeholders. The policies should be applicable in the local context, and they should also be supportive to protect and promote the local industry. It has been further argued that the effective

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<sup>17</sup> PEMRA stands for 'Pakistan Electronic Media Regulatory Authority'



implementation of policies through an efficient regulatory authority is equally important in order to ensure that the spirit of policies is not lost in the translation processes during their implementation.

### ***Pro-Investment Policies & Resolving the Security (Law & Order) Issues***

The users realize the need for a secure and business-conducive environment with comprehensive institutional support in order to encourage investments. They consider that the increased facilitations, financial incentives, legal and regulatory support, removal of bureaucratic hurdles, and the provision of sustainable policy framework may also help to gain investors' trust and confidence. However, in the wake of an on-going internal political and economic instability and the increasing security issues raise a big question mark on the government's capability and credibility to ensure a secure and safe business environment for the telecom operators; so that they could commit resources on infrastructure development or even to carry on their normal business operations, especially in the turbulent and volatile areas. Hence, in the presence of these macro-economic issues, any further commitment of major investments for the infrastructure development across the country has been seen doubtfully. Here, again an interest alignment is obvious to observe in between the users and telecom suppliers. Since the users fully understand the significant relationship between the government's facilitation to the suppliers & investors and growth of the telecom sector; and in result an increased access to more competitive services and employment opportunities that essentially benefits both the telecom users and society in general. In this context, the government has been recommended to additionally facilitate the local investors and companies with privileged incentives in order to encourage and enhance their participation in the development of telecom sector.

There is another aspect of security and the general law and order situation, which rather directly affects the users. From the users' perspective, it is now becoming quite unsafe in some parts of the country to roam with an expensive mobile handset, laptop or other digital gadgets due to an increased scale of robbing and stealing incidents over the past few years; where even many casualties have been reported occurring on the daily basis. An alarming example has been quoted here to highlight the risks associated with the unconscious use of mobile phones with respect to unknowingly being associated with a terrorism act. At occasions even official warnings have been also publicly issued to all telecom users, as asking for not calling back to a missed call or to respond a text message if received from an 'unknown' number (i.e. not registered in the user's SIM) due to the high security risk of being trapped into a terrorism activity. This may happen for example if a terrorist fix a radio-triggered explosive material at some targeted location with a mobile handset placed in its closed vicinity (often with a stolen SIM card) and then before activating the explosive vibrator, the terrorist can make multiple missed calls (only one ring) at different unknown numbers with a hope that someone would give a call back within the set time frame that could activate or ignite the explosives through the received call/message vibrations on that particular handset. In this situation the forensic evidences would lead towards the owner of the stolen or lost SIM card (which was used in the incident) and the caller (the last received number on that particular SIM); hence, unfortunately both the innocent people would be interrogated under the detention.

A second undesired situation may lead to a case, where a stolen or lost SIM card may be potentially used for other criminal acts such as in the kidnapping, robbery or murder incidents in order to mislead the following investigations. Here it even signifies the importance of establishing ‘first information report’ (FIR) cells within the operators and regulator’s vicinity, or at the local police stations in order to register all those SIMs which are reportedly lost or stolen; so that they could be immediately blocked to avoid any potential incidents. Hence, these examples highlight that the elements of fear and risk are high when people hear such stories, and then get extra careful about any potentially negative consequences of the unconscious use of different ICT gadgets and services.

### ***Establishing Competition through Controlling Monopoly and Anti-competitive Practices***

The users assume that competition has helped the mobile sector to grow rapidly with improved services and reduced prices; however, the similar effects didn’t take place in case of the fixed telephony and internet services because of the fixed incumbent’s market monopoly and its stringent control over the essential facilities and basic infrastructure. The users appreciate healthy competition among the telecom operators; so that the competition could bring more variety of products with better quality at competitive prices. However, the users also appreciate the entry of new market players such as MVNOs in the mobile business. However, the user’s perspective on this issue is in conflict with the interests of the existing mobile operators for an obvious reason that the established operators want to preserve their shares in the market. On the other hand, there is an interest alignment between the policy, regulatory and user domains on this issue, since the policy & regulatory domain is in favor of issuing licenses to MVNOs in order to make their entry possible; not just for the sake of competition, but also to generate additional revenue by issuing new licenses.

The users recommend that the status of market competition should be vigilantly observed, especially when there is an obvious risk of anti-competitive practices to occur. The policy and regulatory domain has been asked to ensure a level playing field for all the competing players with no favoritism or the involvement of vested interests either at the official or personal levels. Hence, fair rules should be applicable to all the market players equally and transparently, leaving no serious grievances behind it. The author suggests here that in order to ensure the element of transparency and fair business practices; the mandate of the competition commission and sector regulator can be further strengthened by the backing of an independent ‘justice tribunal’ to handle the difficult situations, when faced with unfair and unbearable external pressure from any corner. Such a tribunal may be given the task to conduct swift hearings and make bold judgments in case of the filed anticompetitive grievances, in collaboration with the sector-specific and competition regulators by following a fair and transparent process. This would also raise the level of trust of the users and other market players on the pro-competitive role of the policy and regulatory domain.

### ***Dealing with the Excessive Load-shedding Issue***

The load shedding issue has been noticed primarily a major concern for the internet users, since most of the internet users still work on their desktops that require continuous backup power supply, as opposed to the laptops. The internet access equipments i.e. modems and routers (the customer premises equipments or CPE) for accessing dial-up, DSL and WiMAX services also require continuous power supply; however, the mobile internet (i.e. the internet access supported by the

cellular GPRS/EDGE networks<sup>18</sup>) and EVO service do not require as such the power-on requirement for CPE, since in those cases the CPE is essentially a USB stick that is inserted in the computer to get connected. Hence, in all those rural communities where the power remains off due to the excessive power load shedding up to 20 hours a day; the debate about the diffusion of internet services seems to be a meaningless talk. Even in the urban areas where the load shedding hours often exceed up to 6-12 hours a day with unpredictable schedule, it is very frustrating to work with computer or the internet due to the continuous disruption and a risk of losing unsaved data each time when power goes off abruptly. Hence, this could be easily understood now why do people still consider it a waste of resource to get a monthly subscription for the internet access? In comparison, the relative dependence of the fixed line and mobile users on power availability is much lesser than internet users. However from this perspective, VoIP service (IP telephony) is also vulnerable to power availability, since in that case the voice communication will be disconnected when the CPE is not powered on; hence in case of the power outage, a redundant or additional backup power source would always be required. In light of the above discussions, it is apparent that the use of internet and VoIP would be severely affected from the excessive load-shedding problem; and that's why the users strongly urge government to make substantial reduction in load-shedding hours.

### ***Facilitating Innovative Services and Modernization of Telecom Infrastructure***

The respondents (mostly students) were found to be very much pro-innovation since they were very keen for the introduction of new technologies and network modernization. They argue for the abolishment of obsolete technologies and demand for the up-gradation of deployed networks, such as in case of the deployed copper network which has been primarily used for the last mile connectivity. They consider that the bureaucracy doesn't fully support the idea of a swift transition towards the adoption of modern ICT technologies within their own premises and organizational practices as well. The respondents react that the general tendency among the decision making authorities reflects that they are often delayed in their response to a smooth and swift adoption of new technologies in a planned way.

The users view that the current regulatory barriers upon VoIP service (IP telephony) is quite unjustifiable, since it benefits the users in a great deal both in terms of its innovative features but also due to its relatively quite low service charges. Hence, they demand for the abolishment of the current regulatory restrictions on this competitive technological solution to further facilitate the telecom users in the country. They condemn imposing any regulatory restriction on VoIP just because the government cannot seek ways of collecting sufficient revenues in this case, the way it currently recovers huge amounts in terms of excessive taxes from the fixed line, mobile and broadband services; or because these new emerging innovative technologies may pose a potential threat to the business interests of the established market players of the fixed line and mobile telephony services. In this context, an interesting story was brought into notice by some users, in which case an ISP had offered a service back in early 90s that facilitated two roaming handsets to communicate with each other using VoIP technology; regardless of their locations, either free of

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<sup>18</sup> EDGE and GPRS stand for 2.5G cellular technologies namely the: Enhanced Data rates for GSM Evolution; and General Packet Radio Service respectively

cost or at substantially low rates. However, it was further informed that the government and regulator eventually imposed restrictions over that service after declaring it an illegal practice; probably as suspected, under the pressure of the fixed incumbent and mobile operators.

The government has been also asked to speed up the 3G licensing process as they are already quite delayed when compared with the developed countries, where 3G services have been already made available for a decade now, and the propositions for 4G networks are already on the table. Users favor customized solutions and user-driven innovations, in line with the users' actual needs and requirements, and the changing market trends. The users (i.e. primarily the students in this case) want to be exposed to the modern equipments and state of the art technologies developed across the world in order to keep abreast of the times. They also argue for the development of scientific knowledge and innovative technologies in established 'centers of excellences' (CoE) within their own academic and industrial premises. The author agrees with them knowing the fact that the scale of investments on the infrastructure development and competence building in any country is a sign of its government's long term commitment with the industrial development and economic growth.

### ***Restricted Use of Multiple SIM Cards***

The users appreciate the idea to issue a restricted number of maximum SIM cards to any individual, primarily from the security point of view and to also protect the others' privacy being violated. The users demand for stopping the issuance of excessive number of SIM cards to unverified customers in order to curtail the misuse of mobile phones for unwanted and criminal activities. They ask the regulator to block all the remaining unregistered SIMs; and to reopen them only when the documented records have been properly verified after thorough investigations. However, the regulator has already taken strict measures in this regard and millions of unregistered SIM cards have been blocked, as reported in the regulator's website. The users want the regulator to keep proper check on the operators if they were found guilty for neglecting the identification procedures during the SIM registration process. It was found that the operators were also supporting this idea but primarily not from the security or privacy point of view. On the other hand, the operators support the idea of issuing restricted number of SIM cards to an individual basically to enhance the customer's loyalty and to reduce the currently high 'churn rate'; since the inactive SIMs cost them additional in terms of operations, activation tax, and also due to the less optimal use of numbering plan. However, the government's interest is in line here primarily due to ensuring the security and avoiding the misuse of mobile phones for the criminal activities. Hence it can be seen here that the different domains have different underlying reasons and interests in pursuing a common proposal.

### ***Privileged Facilitation for the Targeted Segments of Society***

Finally, the users (mostly students in this case) demand special incentives from government, and also the specifically designed offers and packages on privileged terms and conditions. They want free and fast access to wireless broadband services all across the academic campuses; which has been reported currently unavailable in most of the academic campuses and institutions (est. 2010). The students were seem quite frustrated due to the very low quality of the provided ICT facilities, that makes them unable to efficiently interact and get benefited from those facilities, even for the academic research and educational purposes. They also demand from government to substantially

reduce excessive load-shedding hours particularly during the academic hours in the educational premises, which severely disrupts their educational activities due to these frequent power outages.

#### **5.10.2 The Users' Recommendations for the Supplier Domain**

The users make list of recommendations as arguing on different issues relevant to the telecom suppliers in order to help them understand their specific concerns on those issues. Here by supplier domain, we basically mean the telecom operators and service providers since the debate is primarily about analyzing the relative diffusion of telecom 'services'. Hence, the users' recommendations for the supplier domain essentially aim at highlighting those factors, which are perceived by them as the decisive elements that critically affect the rapid and smooth adoption of telecom services.

##### ***Improving the Quality of Services (QoS)***

Quality of service (QoS) remains the biggest concern among the ICT users, since the highest numbers of recommendations made by the users for the supplier domain come under the QoS category. The users strongly demand from the fixed incumbent to improve its QoS by improving its network (i.e. line maintenance and its up-gradation) and the delivered customer support services. The users in general, appreciate and positively acknowledge the rapid deployment of mobile networks and its extended coverage all across the country, particularly during the past 6 years after the telecom sector's liberalization. However, they insist on differentiating between the tasks of access provision at one hand, and the delivered QoS both in terms of signal strength (i.e. addressing the issues of call dropping, signal fading, poor voice quality & interference) and customer support services on the other hand. They consider that the provision of accessibility (coverage) is one thing while provision of usable service (i.e. with maintained QoS) is a whole different issue, and both issues need to be addressed simultaneously. QoS has been called among the biggest reasons why users switch to other operators in hope to get better coverage and the signal quality. The ISPs and broadband operators have been also asked to improve their data rate, coverage and connectivity.

Users ask the operators to more focus on QoS and their customers' level of satisfaction with the delivered services, instead of worrying too much about the squeezing profits and grabbing the market shares of the rival operators. It has been recommended that the operators should go for the 'excellence and value creation' instead of focusing too much on aggressive marketing and engaging in price competition. However, it has been brought into notice that many operators when they start focusing on introducing innovative and new value-added services, often they lose their focus on maintaining the quality of already delivered services, which eventually hampers their reputation in the market even before the launch of new services. The operators are recommended to continuously verify the quality of their delivered services at different locations and at different timings. The operators are also asked to better equip and train their staff to efficiently respond to the consumers' complaints within a given timeframe. The author assumes here that the improvements in telecom services require a joint effort on behalf of the supplier and the regulatory domains; since many issues relevant to the QoS also has to do with the government's facilitation through removing the bureaucratic hurdles, providing institutional support and establishing a transparent mechanism in dealing with the different public authorities. The users further demand from operators to bring some consistency and transparency between the declared and actually delivered QoS attributes.



Furthermore, for international communication, satellite-based solution has been recommended to be used as a backup to replace or complement the under-marine fiber cables, especially at times of emergency. Due to the cost factor and ‘latency’ element involved, the satellite solution has been often not recommended for the backhaul data transmission within the country. On the other hand an efficient standby microwave-based backup system has been suggested to be used as the carrier for carrying the nation-wide dialing (NWD) calls and data traffic in case of facing any major defect in the underground dark fiber network.

### ***Assuring Affordable Prices with Enhanced Billing Transparency***

From the common users’ perspective, it’s amazing for them to have such low-priced text messaging and calling rates, as currently offered by different competing mobile operators. However, the users hope to also enjoy the same experience in case of the fixed line and broadband services. The policy and regulatory domains are also in line with the users’ approach and want to bring the prices down for the fixed line and broadband services through inducing more competition in those markets. However, the consumers also demand for the removal of excessive line rent in case of the fixed line, the unnecessarily high amount of taxes (i.e. GST and ‘activation tax’) and all the hidden charges (including charges for the balance-inquiry service). They hope that the restructuring of pricing including both tariffs and taxes would help in bringing the prices further down in order to make them within the economic reach of a common man. They suggest that an improved understanding of the average users’ economic conditions (i.e. their purchasing capacity and the associated needs) would help the operators tailor their tariffs accordingly; while also keeping in mind the drastically higher inflation rate, particularly as experienced during the past few years. The author suggests here that in order to give an affordable access to ‘bottom of the pyramid’, the operators may also introduce ‘differential pricing’ schemes for different user segments, population pockets and for specifically targeted areas in order to facilitate their use of telecom services; hence, improving the teledensity and addressing the ‘digital divide issue’ as well.

Some users highlighted the fact that roaming charges (when travelling abroad) are unduly too high for the domestic mobile users. Many users feel like there is no way to challenge the transparency of the issued bill in any meaningful way; hence, it often seems like the operators are charging the users arbitrarily. The users demand for improvement in the billing transparency. They want every detail to be explicitly mentioned in the received bill in accordance to the terms and conditions of the subscribed package; while leaving no doubt for the users to get upset with. Furthermore, it has been told that sometimes the users were being charged for different additional value-added services, even without letting them explicitly be informed about that. The operators should avoid complexities in the billing process; and rather they should make it as much simple and understandable as possible, knowing the low literacy rate of the country. The author also assumes that the increased billing transparency would help operators gaining the consumers’ trust and increased loyalty.

### ***Managing Customer Relations & Consumer Rights with increased Responsiveness***

Operators have been asked to strengthen their relations with the customers for their increased satisfaction. Customers want to be treated with due respect and full concentration by the customer

services and technical support departments. The operators should facilitate their customers in easy, polite, user-friendly and cooperative manner, following the customers' pace of communication and level of understanding; instead of dragging them hectically due to the time-constraint, as commented by the respondents. They further explain that often the customer goes through a feeling of embarrassment and confusion while talking to these phone operators due to their fast communication speed and the used language that is too difficult to be properly understood by a common man. The users want the customer services department to properly understand the reasons for the customers' dissatisfaction for not being empathetically heard; in order to address their genuine concerns. They are advised to deal patiently with the customers and acknowledge the customer's right to be informed and responded properly. They ask operators to appoint courteous people at the helpdesk (or at helpline); both equipped with the sound technical knowhow and user-friendly communication skills, and also with a positive attitude towards the customers. They need to gain the trust of the customers by properly informing them both about the pros and cons of all services. They should fully respect customers' demands and queries in order to effectively address their needs and requirements. The users express their feelings that the operators are more focused and polite towards the larger (corporate) customers and showing less respect and care for the individual customers. In this regard, the author adds on here that treating to every individual customer on equal footing regardless of its financial contribution to the operator's generated revenues actually comes under its 'corporate social responsibilities' (CSR) for which it is fully accountable. Even technically speaking, an economically poor customer probably may not be generating outbound calls that frequently; but still that customer may be contributing significantly by creating inbound calls for the operators, hence generating substantial revenues for the operators.

The operators need to improve their efficiency in order to shorten the 'response time' required in addressing a query or complaint without compromising on fully serving each customer up to his/her optimal satisfaction. It is recommended that they should implement an easy to use and fully interactive CRM (Customer Relationship Management) system, aiming at delivering quicker and effective customer services. The operators have been requested to further reduce their service delivery and application processing time. The users should be considered as a valuable asset for the company, especially when the market is highly competitive and seems almost like saturated (in case of mobile services). Hence, in such a competitive market situation, the dominant strategy for the operators remains the retention of existing customers and the reduction of churn rate through strengthening their ties and relationship with the customers beyond the transactional level; in order to enhance the customers' commitment and association with the operator. It has been recommended for the operators that by effectively taking into account the customers' suggestions and feedbacks may also significantly help them in bringing improvement in their performance. Hence, the operators should carefully and attentively listen to the users' comments, complaints and recommendations. The author agrees here that working in close contact and collaboration with the customers would greatly facilitate them introducing 'user-driven' innovations, which is currently the leading trend among the innovative and advanced markets of the modern world. The users further suggest that the commitment of individual employees is also considerably an important element in the value delivery; hence the employees' full devotion and commitment must be assured

through actively engaging them at all levels during the product development and its diffusion. In line with the users' comments, the author further adds that the customer's satisfaction and value creation should be remained the prime focus of the operators; instead of too much worrying about increasing the profit margins and obsessed within the competitive maneuverings. It is common to say that 'actions speaks louder than words'; hence, merely depending upon the promotional ads won't be productive and can't make any difference, until the customer's demands, expectations and complaints are fully addressed and effectively responded within due time.

In addition to that, the users also demand that telecom operators should strictly follow the marketing ethics when they run their promotional campaigns. For customer awareness, it is good that the operators make them aware of different updates regarding the introduction of new packages, prices and services occasionally, but at the same time the customers' messaging inbox should not be bombarded with irritatingly high amount of unnecessary and undesired marketing emails and text messages. They appreciate lesser in number but clearer advertisements on the TV channels and newspapers; hence, clearly explained and easily understandable with all the necessary details. Also the frequency of the repetitive ads of TV should be considerably reduced; since they become annoying sometimes. The users also acknowledge the fact that currently there are disproportionally high number of TV ads from the mobile operators when compared with the ads from the fixed line and broadband operators. This reveals the fact that the operators within competitive markets are more under pressure in investing on the marketing ads for the promotion of their products and the brand image in the customer's eye, as compared to the less competitive markets.

### ***Content Development, Market Awareness & Creating Demand-Side Economies of Scale***

The users demand for the availability of useful and relevant contents and applications with simplified access and usage possibility. An easy and user-friendly user interface has been recommended using a simple software program (also in local languages), where different range of useful contents and relevant applications should have been made available in a very simple way (using a 'three-click' approach i.e. every application should ideally be ready to use within three 'cursor clicks' on the screen). The author presents here an example of such an application with the proposed name 'MyWeb' in appendix 3, which might help the operators and content aggregators in further developing the business concept and the viability of the 'content aggregator' business model. The author here also presents another business model with the proposed name 'PaySol' (refer to appendix 4) that may facilitate the monthly bill payments through an online application.

It has been discussed that if internet is to diffuse in the mainstream user market, then the real needs and bottlenecks of the vast majority of rural communities and the relatively illiterate urban population (that together compose around three quarter of the total population) have to be properly understood and effectively addressed accordingly. It is estimated that this vast majority of the total population is literally unable to properly interact or even understand the contents and applications currently available on the web; hence there is a dire need for translating a large amount of those contents and applications into their local languages. In addition to that, there is also a need to make those contents and applications tailored to their specific needs and requirements.



In this context, the author recommends that government should encourage and cultivate the trend of establishing 'science and technology parks' within in the close vicinity of the university campuses across the country to help creating avenues for the industrial & academic collaborations, with given an additional task to develop ICT products, useful contents and relevant applications consistent with the local context in result of a joint effort between the innovative triangle of University, Industry & the Government (U-I-G) as referred in the literature by the 'triple-helix model of innovation' (Etzkowitz, 2007). In this context, the author further suggests that in order to address the social and moral concerns associated with the use of mobile and internet contents; a separate institution should have been established under the auspices of a joint body including the representatives of all the important stakeholders, given the task of the aggregation of useful contents from different content developers and publishers, and followed by the process of content selection and filtration in light of the given policy framework. But it is insisted here that such content filtration should only be restricted to the efforts targeted at addressing the moral and ethical aspects of the delivered contents; and definitely should not be used for restricting the political voices and social campaigns.

The users acknowledge that the vast population is still utterly unaware of internet, and the relevance and usefulness of its different applications within the context of their life. Hence, they realize that the public awareness programs are very essential to be run in order to let the masses get aware of the potential benefits of using internet and other ICT technologies and services. An example was given that many students didn't know the effective use of internet in context of their educational learning and academic activities until they had reached to universities or were already about to finish their graduate studies. When some of those students were asked about the reason for their relative ignorance regarding the effective use of internet for the learning and educational research; they simply replied that they never had felt any acute need of using internet during their education, nor they did ever feel any supervisory and competitive pressure either from their teachers or from the other peer students respectively. In addition to that they also revealed the fact that they did not receive any proper guidance from their university administration in this regard, which could have inspired or compelled them to effectively adopt internet for achieving educational excellence.

Finally here in line with the users' comments, the author suggests that as part of the awareness programs, different training sessions and tailored-made courses should be arranged; as initially designed for the public sector employees and the teaching and administrative staff of the academic institutions. In addition to that, it is also recommended that all the routine applications and daily work activities within these institutions should be gradually transferred to web-based applications; thus the contents should also be made available online for the relevant users. By doing so the general public could also be convinced or otherwise compelled to use those online procedures in order to avoid paying any additional charges in case of choosing the old-fashioned manual procedures. However, there should also be some additional incentives for those who adopt those online services in order to persuade and allure the general public as well. These additional incentives may include the physical facilitation such as; the relative ease and comfort, general appreciation and social recognition, and most importantly some obvious financial benefits for

swiftly adopting those online services and applications. It is assumed that such a dual-mode strategy would substantially facilitate the diffusion of ICT services among the masses, especially in terms of creating the 'demand-side economies of scale'. Following the above mentioned strategy, it is here further assumed that the elements of the physical comfort and financial incentives would principally stimulate the first three adopters' categories namely: the 'innovators', 'early adopters' and 'early majority'; whereas the elements of physical fatigue (e.g. queuing in long lines to wait for their turns) and the fear of paying additional charges in case of choosing the option of manual procedures would essentially compel the last two adopters' categories named as 'late majority' and 'laggards' (through 'forced migration') to adopt the online applications. In this regard, some effective marketing campaigns and awareness programs (such as easy and interactive TV documentaries) might help people getting aware of the use and potential benefits of different ICT services and applications. The current debate is concluded here with the fact that awareness creates appetite; and appetite creates an increased demand for the relevant contents and applications.

### ***Facilitating Users in Overcoming the Technological 'Complexity'***

A product's 'complexity' refers to the relative scale of difficulty and inconvenience that a user may encounter when interacting with that particular technological artifact or a service. Oppositely, a product's 'simplicity' refers to the scale of convenience, comfort and user-friendliness that a user feels while interacting with that specific artifact or service. It has been commonly observed that the elderly and illiterate people often face greater difficulties than of the educated youngsters in understanding and using the different digital gadgets and services. Many people have been observed literally afraid of using mobiles and computers, and accordingly the accompanied services and applications. Such users often also feel embarrassed asking to someone else to help them learning the effective use of those devices and subscribed services. Hence, the telecom suppliers have been recommended to facilitate such users in learning the effective use of subscribed services and applications. Such training sessions and assistance facilities can be provided using the telephonic helpline services or through helpdesks at the customer support services located across the country.

### ***Introducing User-Oriented Packages with Scalability and Flexibility***

The users seem quite excited about the new competitive offers and interesting packages, but at the same time they are equally conscious about the bombardment of new packages by telecom operators (especially in the mobile services market). At one hand, they appreciate the introduction of attractive and beneficial packages with reduced prices or with new and improved services; but on the other hand they also demand for bringing some consistency in those frequently offered packages, instead of unnecessarily introducing new packages every second day. The users find those packages often confusing and overlapping, especially from a common man's perspective to make sense out of such rapidly changing offers. It is further told that such duplicating and overlapping packages (as often valid only for limited period of time) makes the subscribers totally confused about the status of the package they are currently subscribed to, and to decide what package they should switch to. It has been recommended that the offered packages should be made more user-friendly and user-oriented with the possibility for the users to compile for themselves the most suitable and desired features of the subscribed services within their own self-designed packages; that could have been essentially considered as fully tailored and customized as per their

actual needs and requirements. The author also considers that the provision of such scalability and flexibility within those offers would likely to give a new life and a better projection of the basic concept and the potential value of such packages in the eyes of customers.

The users support the idea of ‘price discrimination’ as also proposed by the author in order to increase the affordability of different segments of society e.g. by offering special package for students and other very low income societal groups; hence keeping in mind the ‘price elasticity’ factor of the different user groups. These specifically designed packages for the targeted group of users are assumed to be helpful in enhancing the value of the offered packages. In Mobile services, the concept of ‘family & friends package’ has been generally appreciated by the respondents since such an offer greatly facilitates the possibility of an unlimited ‘in-circle’ calls and messaging services in return of paying a monthly fixed charge. It is expected that such packages may also help in increasing the number of postpaid subscribers and the customers’ loyalty element. Finally, the users quite bluntly ask the operators and service providers to avoid bluffing the customers by confusing them with tricky packages. It has been said that such practices and marketing tactics would not bring any long-term benefit for those operators and service provider, since they would eventually lose their credibility and the element of trust in the customer’s perception.

### ***Controlling over the Mismanagement and Administrative Issues***

There were many grievances heard by the respondents, which were basically related to the issues of mismanagement and administrative inefficiency committed by some telecom operators; e.g. the cases related to unacceptable delays in the application processing and the relative response time to the filed complaints, the cases of corruption and dishonesty, and the lack of courtesy that make the users really upset sometimes. The users want operators and service providers to be more dedicated and committed in efficiently delivering telecom services, while also effectively addressing their grievances and concerns in the shortest possible time. The operators have been also requested to become more disciplined and responsive, while attending the customers’ complaints and queries.

### ***Addressing the Safety and Security related Issues regarding the Use of ICT Services***

The users talked about their higher concerns and feeling of insecurity while thinking about the use of mobile and internet for the transactional purposes; such as for different online commerce applications (e.g. online purchasing, bill payments, and banking applications). The customers feel that their personal data and account details are highly insecure, when they listen to others’ personal experiences and the spread stories. That makes them highly conscious and afraid of making any purchasing or transactions using their credit cards; either through internet or using their mobile phones, due to the fear of any mishap and the prevailing sense of insecurity in case if their personal data was tracked or stolen by an intruder for a potentially fraudulent transaction. It is relevant here to share the author’s own experience during his stay in Pakistan during the period of conducting this case study. One day the author received an anonymous text message on his mobile phone and as soon as he opened the message, it was discovered that his all mobile prepaid balance was already transferred to another unknown account; hence the mobile was left with zero credit. Such malicious cases and fraudulent attempts are commonly heard all across the country; and in result people get afraid of using the mobiles and internet services for the transactional purposes out of the fear that

their credit card information may potentially be misused due to such data security breaches. There has been a strong call for restricting such cyber crimes. The author agrees with the fact that until proper safety and security measures have been taken and the confidence of general public has been restored on online transactions, the operators should not expect any significant growth within the different applications related to e-commerce or m-commerce.

In order to discourage the stealing and robbery incidences of the ICT gadgets, as discussed in the previous section, the author here recommends that the operators should design and adapt a tracking system in order to track down the stolen and robbed mobile phones and laptops through collaborating with the telecom vendors in order to help the Police in catching the culprits. This could happen e.g. through using built-in RFID tags or other low cost tracking devices on the mobile phones and laptops; and making a proper mechanism of registering and tracking the registered devices somewhat in a similar fashion as observed in case of the ‘car tracking system’, but it must be quite significantly at a cheaper price (i.e. not more than 10% of the product’s actual value). It has been further assumed that addressing this critical issue would generate an additional source of revenue for the telecom suppliers.

#### ***Fulfilling the ‘Universal Service Obligations’ (USO)***

Finally, the users ask the operators to fulfill their part of responsibility in achieving the objectives of ‘Universal Service Obligations’ (USO) by expanding their network coverage across the country to ensure the availability of all basic ICT services with reasonable quality at an affordable price to the rural and under-served areas as well. The users demand that the telecom operators should fulfill their social objective and show some commitment for the betterment of society, despite the fact that they are essentially commercial entities.

### **5.11 The Role of Consumer Groups as ‘Spokesperson’ of Telecom Users**

Most of the developed nations have long experienced the presence and an effective role of the consumer groups, as standing firmly on behalf of the consumers to protect their rights; however, such practices are relatively a new experience for the developing countries like Pakistan. Nevertheless, under the United Nation’s (UN) charter and its revised guidelines issued in regard of the consumer’s protection (2003), there were claimed some initiatives to have been taken in this direction. However, Khan, S. M. and Hafeez, A. (1999) rightly comment that “in a country like Pakistan where even the basic rights of citizenship are frequently contested before the courts; consumer protection is rather a more problematic and neglected category”. Recently, there have been reported some consumer groups (or associations) formed, as essentially aiming at protecting the consumer rights and taking care of their welfare; however, the effectiveness of these consumer groups is still under a big question mark. In the meanwhile, it appears to be the case that the policy and regulatory domains have also realized the need (in result of sensing the global trend) for giving an increased weight and mandate to the consumer voices in the development, diffusion and the use of technological products and services. Therefore, the consumer laws & regulations have been now made at the provincial level (however, currently only in the province of Punjab so far), and also at the federal level. In addition to that some ‘consumer courts’ have also been established in couple of

provinces at district levels; however their efficiency and effectiveness regarding their case handling capacity has yet to be investigated by independent sources.

There are number of consumer associations and ‘web blogs’ which apparently exist at least on the ‘web’ space, just to notify their presence. Some of those groups might have a marginal impact and certain level of activities; however most of them are seemingly quite passive, since the author did not receive any acknowledgments about their presence and noticeable activities from other market stakeholders. However their websites contain some informative documents and relevant texts, which might be considered useful to some extent for the academic research purposes. It is expected that as the industry would gradually mature, the role of the consumer groups would be further enhance and properly acknowledged by other stakeholders. Despite acknowledging a marginal role of the consumer groups, the operators are however skeptic about their unnecessary vigilance over the health related and environmental issues with respect to the use of ICT services, particularly in case of mobile, WLL and broadband wireless services. The operators view that neither the voice of those consumer associations is strong enough to be properly heard among the other domains; nor the general masses are even aware of the existence of those groups and their activities.

For protecting consumer rights, the regulator has established a separate directorate which is responsible for the issues relevant to the consumer rights, and it also engages with those consumer groups and individual consumers in order to hold operators accountable for properly addressing the customers’ complaints. In addition to that the regulator has also established a helpline and a ‘complaint cell’ at their website, where they attend the consumer complaints. However some operators comment that the PTA’s helpline service is often found occupied and thus rarely responding. PTA has published an ‘inter-operator tariff comparison’ chart on its website for the consumers’ facility to effectively compare the tariffs and the relative service attributes of the competing operators. Furthermore a representative of the consumer associations has been given the board membership in the USF (Universal Service Fund) Company in order to better understand the consumers’ perspectives on different issues concerning them. Hence, the representatives of those consumer associations are supposed to act on behalf of telecom consumers as their ‘spokesperson’.

Most of the content and reading materials on the websites of these different consumer associations which are currently operating in Pakistan were found in English language; which simply looks absurd if they really aim at protecting the consumer rights through creating awareness among the masses. Ironically speaking, to hope creating awareness among the masses with their websites made in English language within a country where the overwhelming majority is still illiterate or utterly unable to read or understand the contents in English, seems totally ridiculous. An obvious question could have been asked here that how come these consumer associations might claim to play the role of spokesperson on behalf of the telecom consumers in Pakistan to effectively represent them at a grass root level within the media and in front of the policy, regulatory and supplier domains if their fundamental interface with the general public has no match with the ground realities.

## Chapter 6

### Debating Major Issues Relevant to the ‘Policy Domain’

This chapter provides a comprehensive account on all those major issues, which are considered as relevant to the policy domain. The range of discussed issues include the topics like understanding the role of MoIT, existing policy framework, licensing policy, telecom reform movement, digital divide, telecom investments, grey trafficking, excessive taxes, privacy, social and moral issues, law and order situation, broadband benchmarking, and the need for consensus-building on key issues.

#### 6.1 The Role of MoIT

The primary role assigned to the government’s Ministry of Information Technology (MoIT) is to lay down a policy framework and to deliver essential guidelines at regular intervals whenever required, for all the interested parties and the relevant actors participating in the development of ICT sector in the country. In that connection, the author presumes that MoIT should have a clear vision for leading the country towards an information-led e-society in order to enhance its collective performance in all walks of life, so that it could become a competitive nation among the other nations of the world. Hence, its primary agenda should be to create consensus among all the relevant stakeholders towards a common vision through providing various venues of discussion forums, and creating other consensus-building platforms and occasions; such as by initiating different collaborative projects among the market players. However, this requires a firm commitment, long-term vision and a proper strategic formulation on behalf of the ministry.

The above discussion highlights the specified role and mission for the ministry with respect to the development of ICT sector, in order to facilitate the desired transition towards becoming an e-society. However, the collective voice of the respondents belonging to different domains clearly indicates that the ministry is not optimally performing the role what it was supposed to be doing. Its role has been seen so far quite ineffective and marginal in the overall picture as portrayed by the respondents. The operators consider that the ministry sufficiently lacks the required technical expertise and the strategic orientation in order to profoundly understand the nitty-gritty, and the real complexities and internal dynamics of the telecom sector. The ministry has been asked to improve its understanding of the business dynamics and the sector-specific issues in order to effectively address those issues. They criticize that instead of assuming a proactive and leading role for itself on the key issues; it seems like the ministry currently plays a marginal role at many occasions, as acting like a ‘distant observer’.

The ministry has been considered during the past decade largely ineffective because it couldn’t perform any major role apart from publishing some policy documents (such as the deregulation, cellular and broadband policies) with the help of foreign consultancies during the years 2002-04; however, whose reviews and updated versions are even yet to be published. They recommend that for such a specialized and technical ministry, the appointment of a minister should also be based purely on the merit as per the relevant exposure and level of education of the candidates. The

government has been further asked to reduce its unproductive and extravagant expenditures on their protocols and luxurious spending; and rather it should deploy those resources on the sector development with the help of other stakeholders. They further argue that the ministry should principally facilitate the foreign investors and consultants in building the necessary infrastructure; but in parallel to that the government should also focus on developing the indigenous competencies in order to get achieve self-reliance and economic independence from the foreign loans and expertise; by gradually increasing the relative participation of the local investors, the ratio of domestic production and the effective export of those locally produced goods.

### ***The Transition towards e-Society***

The operators suggest the government and the relevant ministry (MoIT) to spot out on the merit basis, a pool of talent at one place, which could be named as the ‘think tank’ forum. The forum should be given the mandate with sufficient institutional support and the required amount of resources in order to come up with some common vision, clear objectives and a properly chalked-out action plan to be effectively implemented with respect to the envisioned transition towards becoming an e-society within a given timeframe. The transformation to e-mode is a gradual and transitional process, which takes time but the process can be speeded up with properly implemented strategies through making the delivered services more enticing, relevant, productive and affordable for the society. Such a gradual transition has been witnessed in the recent years, for example in case of an effective adoption by the general masses of: the ATM (Automated Teller Machine) facility for money withdrawal, instead of queuing in a bank; in the cost-effective usage of mobile phones for their general communication purposes; and an increased use of website and email addresses in their visiting cards, particularly at an institutional levels and among the business communities in order to lift up their face value and extend their reach.

## **6.2 The Policy Framework**

MoIT sheds light on the evolution of current policy framework; saying that initially the old incumbent T&T (Telephony & Telegraphy), now renamed to PTCL, had been conventionally playing multiple roles of the sole operator, regulator and policy maker altogether simultaneously, as we have observed such a dominant role of the incumbent in other parts of the world as well. But then after entering into the WTO (World Trade Organization) regime, and following its given framework for bringing reforms in the telecom sector; subsequently a ‘Telecom Reorganization Act’ was implemented in 1996, which resulted in the divestiture of the old T&T into different parts. In the first step the national incumbent (a government department) was corporatized and then turned into a company called PTCL. Second step was taken by making a new telecom regulator called PTA to look at all the regulatory affairs. As a third step, the policy matters were decided to be dealt by the Ministry (it was called that time the ‘Ministry of Communication’, then the ‘Ministry of Science and Technology’ or MoST, then the ‘Ministry of IT’ or MoIT, and finally now it is named as ‘Ministry of IT and Telecom or MoITT). The mobile operations were also separated from the landline operations by establishing a subsidiary company called PTML (Pakistan Telecommunications Mobile Ltd.). Hence, the three significant functions were separated as inspired by the WTO reform process; where operations were handled by PTCL, regulatory affairs were dealt



by PTA, and MoIT was asked to take care of the policy matters. MoIT has been split into two divisions called IT and Telecom divisions respectively.

The operators inform that the sector-specific telecom regulator (PTA), frequency allocation board (FAB) and the sector-wide competition regulator (CCP) are all under the Cabinet Division (CD); while MoIT also due to being a federal ministry comes under the Prime Minister (PM), so it also reports to CD. The CD is headed by the PM, but all other ministers and the federal secretaries (civil bureaucracy) of each ministry are also part of CD. However, here the cabinet division should not be confused with the 'federal cabinet' which essentially represents the elected political body (the ministers) as appointed by the PM to run the government affairs. MoIT is headed by a federal or state minister (as a representative of the federal cabinet), and the ministry is not supposed to intrude or intervene in day-to-day operational details (the business activities) of the sector; apart from issuing relevant policies and assuring that the policies are being implemented within its real spirit (by checking that no distortion of meanings or wrong translations had occurred at any stage during the policy implementation) in order to take the corrective measures accordingly.

The operators further explain that on the policy matters, they correspond with MoIT; but regarding the operational issues like interconnection, licensing and price regulations, they contact PTA. However, for issues related to spectrum interference they may consult both FAB and PTA depending on the case; whereas for media and broadcasting related issues, they contact PEMRA (Pakistan Electronic Media Regulatory Authority). The operators mention that they don't need to bypass PTA in order to directly contact MoIT, apart from dealing with the policy relevant issues. The operators however admit that they often need to seek for the supporting audience (other relevant stakeholders whose interests could have been brought in line with those operators) in order to influence MoIT on the policy matters to promote and protect their common interests. This situation seems quite similar to a case as referred by William H. Melody (2009)<sup>19</sup> in his speech at USC (University of Southern California), mentioning that the competitors and new entrants of the US telecom market once ran a campaign for highlighting their common concern regarding the 'unbundling of local loop' in front of the US regulator FCC (Federal Communications Commission). In result of this campaign, they submitted a petition to FCC against the incumbent AT&T (of that time) back in mid 1980s, after successfully aligning their common interest to end the incumbent's monopoly over the interconnection regime and its control over the essential facilities. Melody also speaks about the ongoing strategic shift within the policy domain (in terms of an increased recognition of the previously ignored issues) namely: from the supply-side focus to more demand-driven approach; from the physical resources to more human capital resources (such as awareness, skills, competencies, applications etc.); and from a focal source of support to more diversified sources (i.e. a combination of both public and private sources e.g. the increased use of public-private-partnership model).

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<sup>19</sup> <http://annenbergl.usc.edu/Events/2009/090914Melody.aspx> (Accessed on January 24th, 2011)



### *The Structural holes and Conceptual Ambiguities in the Policy Framework*

The research discovers that there were many conceptual ambiguities in the respondents' mindset about the structure and formation, and the specific roles and responsibilities of the composing elements of the current policy framework. The author here specifically highlights those structural holes of the existing policy framework and regulatory structure, in light of the information received by the respondents.

Starting from the regulator, it was somewhat surprising that the respondents from the regulatory authority were not quite clear about the existing functional boundaries (sometimes even overlapping) between PTA and the other regulatory, administrative and policy making institutions such as FAB, MoIT, CCP and the Cabinet Division. For example, the regulator (PTA) was apparently found not very lucid to explicitly answer the questions; whether PTA is responding to MoIT or to the Cabinet Division (both in theory and practice), whether FAB is under the Cabinet division or under PTA, and whether the Cabinet division is a civil bureaucracy (establishment) or a political body as essentially representing the different ministries? It was told by regulator that, by law PTA is supposed to be only reporting to the Cabinet Division, but in many cases PTA also reports to MoIT as well, in order to keep the ministry informed and satisfied with its performance. In this context, the operators also add on their comments, saying that in the beginning it was declared that PTA would be an independent authority but for all the practical matters, it appears to be heavily influenced by the ministry (MoIT). During the discussions, it was disclosed that the current Secretary IT of MoIT is also the chairman of the board of fixed incumbent (est. 2010); hence in the presence of such an obvious 'conflict of interests', the question was raised that how come one can expect that MoIT and PTA will act as independent and unbiased authorities? About the second case, it was explained that "by de-jure (i.e. by rule or in law) FAB is an independent and parallel body to PTA, but by de-facto (in practice) it is under the regulatory authority; furthermore that conventionally PTA has been remained the superior authority; since the FAB officials were used to run their activities from the regulator's premises, but later on FAB got a separate building to run its operations". PTA respondents further comment that "at the time when PTA was being established, FAB was already functional and it was an understanding that FAB would work under PTA, but eventually FAB was given the mandate to work as a separate body independently".

In addition to that, the operators acknowledge the fact that, the existence of several parallel bodies within the policy and regulatory domains does create confusion at occasions, because of their overlapping roles and the blurring functional boundaries in some cases. The point was further explained that in the current policy framework PTA is not obliged to report to MoIT. However, it was argued that if PTA was required to efficiently implement the delivered policies, then there must be well-established, explicitly defined, and formally recognized communication channels between the two authorities in order to avoid any confusion during the policy translation and its proper implementation. A similar situation has been acknowledged in case of the formal communication protocol between PTA and CCP, and between PTA and FAB. In both of these cases, again the relatively vague and blurred communication channels between these institutions may result in a conflicting situation; hence, causing procedural delays in the case handling, especially when the

‘role conflicts’ are the likely scenario. For example, in the first case; the ‘role conflict’ situation may appear when handling the cases relevant to establishing competition, controlling monopolistic abuses, mergers and acquisitions, and dealing with other anticompetitive practices within the telecom sector. In the second case; the situation may appear when encountering with unwanted delays in the licensing process, with the aim to adopt a fast and smooth process for the spectrum assignment by reducing the needless bureaucratic formalities and unnecessary complications. The above examples and explanations highlight the need for the required policy and regulatory reform both at the structural and translational levels, by filling the existing communication gaps, and also the procedural and structural holes within the policy framework and the regulatory structure.

### ***MoIT without Minister***

The worst thing disclosed was the fact that the current political government (the government that took oath in March 2008) didn’t appoint yet any permanent minister for IT and Telecom (MoIT) ministry; hence the sector is being run without any consistent formal minister for about three years now (est. March 2011). However, recently an already sitting law minister has been given the additional charge of IT & Telecom ministry to run the affairs<sup>20</sup>. Also it is not a joke, but a matter of fact that the official website of the ministry of ‘Information Technology & Telecom’ itself has been remained inaccessible during this whole period of time, since the author himself attempted several times to open the ministry’s official webpage until this book was sent for publication (est. August 2011). In the absence of any sitting minister and with no virtual presence on the web for that long time; how come the sitting government could be considered serious at all in realizing the importance of IT and telecom ministry for the public’s welfare and for the industrial and economic growth of the country. Hence, in the absence of any regular and formally appointed minister, all the important policy matters and decisions have been forwarded to the PM for the final endorsement (who acts as a care taker minister in the absence of any formally appointed regular minister).

Can one imagine how the investors would assume the government’s this extremely unserious gesture and the ignoring attitude about its concerns (if exist at all) for developing the IT and telecom sector in Pakistan, when the sector has been considered not even worth to have a single regular minister for about now more than three years of its rule over the country? The operators were blunt to say that when it came to sell the licenses to foreign investors or to privatize the national assets, one could always have observed the government’s higher level of interests in the process in order to collect the ‘hard cash’ revenue; but when it was the time to spend the collected money back on the sector’s development and market growth, one couldn’t see even the government’s slightest interest through its any constructive activity. It has been seen even suspiciously by many respondents that when the current government is under the burden of the largest federal cabinet of the national history, then how come it didn’t find the IT and telecom sector charming enough to have appointed a formal regular minister? The respondents assume that there could be definitely some interesting inside story concealed in this whole dilemma which is required to be unfolded (please refer to the section ‘VoIP vs. Grey trafficking’ to get a possible clue

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<sup>20</sup> <http://pakistannewsblog.com/2011/03/29/140109/babar-awan-becomes-minister-in-charge-for-it-and-telecom>  
(Accessed on 13 August, 2011)

about it!). The respondents consider such a short-sighted and opportunistic approach of the government as a very negative and dangerous sign for the sustainable growth of telecom sector.

### *ICT Sector without IT regulator and an Effective IT & Telecom Policy*

In the current policy framework there is no provision given for the need of any IT regulator; working as a functionally separated and fully dedicated to the specific issues relevant to the IT sector, such as the development of software market and the promotion (export) of locally produced software, handling copyrights and DRM (Digital Rights Management) issues, and removing the hurdles in the growth of information industry. MoIT explains the case, arguing that the need for a separate regulator is felt when the industry grows to its maturity level, but since IT is still in its infancy stage here, and thus we wanted to keep it regulation free until the industry matures. Hence, the need for a separate regulator or any regulatory intervention at this premature stage was not considered necessary. In result, it was decided to keep IT under the regulatory regime of the telecom sector; therefore PTA has been given the mandate to also take care of the IT related issues in consultation with MoIT (IT division). The author also considers that in result of an ongoing digital convergence between the different data transport technologies, where all the text/voice/video contents pass as ‘data packets’ through the same digital pipeline called NGN<sup>21</sup> or All-IP network; so probably we would need in the future only one ‘ICT regulator’, and that regulator should have the essential competencies and experience of handling both the IT and telecom related matters in a good harmony, while committing itself to the spirit of ‘technology-neutral’ regulations.

However, the question is raised here, that whether PTA is fully committed or competent enough to deal with the nitty-gritty and the nuances of both the IT and telecom relevant idiosyncratic issues and their eccentric considerations? For such a larger mandate, the single proposed ICT regulator would then essentially need to thoroughly understand the full range of complexities of each of the three previously separate sectors i.e. namely the computing/information, telecom and broadcasting sectors. Otherwise there is a risk of mishandling the regulatory practices in this highly converging ICT sector; and it possibly may result in failure to achieve the envisioned policy objectives.

When the regulator was asked about its current mandate of acting as both IT and telecom regulator; PTA considered however this increased mandate helpful in effectively implementing the ‘price cap’ regulations on different telecom services. PTA considers that its operational mandate should have been even further enhanced at a level comparable to other powerful international telecom regulators such as OFCOM (Office of Communications - the British telecom regulator) and the US regulator FCC (Federal Communication Commission). However, when the regulator was asked about its role as a unified regulator taking care of both the telecom and IT related issues; apparently it seemed like PTA was not ready to effectively undertake its responsibilities as an IT regulator, since PTA primarily considers itself a telecom regulator. On the other hand, regulating the IT sector was essentially considered as an additional charge, which had to be accepted under an obligation due to being asked by the ministry to also take care of the IT-related regulatory issues. However, the regulator admits that PTA is not doing much with respect to the IT related issues in practice. PTA

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<sup>21</sup> NGN stands for ‘Next Generation Network’

transfers the primary liability of developing the IT sector to MoIT, considering the fact that they already have a separate dedicated division which is held responsible for the development of IT sector. PTA highlights the fact that the previously issued IT policy clearly mentions that there will be a quarterly review published by MoIT in order to highlight the developments within the IT sector. But ever since the last published IT policy in the year 2000 and the broadband policy in 2004, there has not been any reviews published so far; and even the previous IT and Telecom Policy has been called already expired in 2008, and thus for the last three years the sector has been run without any effective IT and telecom policy, as mentioned by the regulator. This again clearly reflects the current government's highly unserious attitude towards IT & Telecom sector.

### ***Institutional Mechanism for Conflict Management or Dispute Settlement***

The policy framework is also expected to provide a clear guideline about the formal procedures to be followed in case of encountering any potential conflict among the market players at an institutional level; in order to swiftly and smoothly resolve and settle down those disputes. In this context, different possible scenarios were discussed with the market players, including the ministry and regulator. The respondents consider that if a conflict arises between PTA and CCP, it would be addressed by the cabinet division, since both of the regulatory authorities come under the cabinet division. If the conflict is in between PTA and MoIT, then it would be addressed through consultation between the cabinet division and PM. In the third scenario, if a conflict arises in between the general opinion of cabinet division and the telecom ministry itself on a specific issue, then it would be eventually resolved by the PM (representing as head of the cabinet). However, if a conflict arises between the operators and the telecom regulator (PTA) or the competition regulator (CCP); then the case would be resolved either by the cabinet division, or the case will be filed and settled down in the court. In this regard, it has been commonly assumed by the operators that MoIT is only supposed to be consulted to discuss the issues relevant with the policy making, and not the disputes that emerge during the policy implementation and enforcement by the regulator. However, there were found some differing opinions as well, both among the operators and the other market players on the precise mechanism as assumed to be adopted for the dispute settlement within the policy framework. Hence here again, it is obvious that the regime of 'dispute settlement' or 'conflict management' has not been sharply explained or precisely understood by all the market players, and a degree of ambiguity does exist which needs to be removed by providing clear provisions on this issue within the given policy framework.

### ***Government's Unjustified Intrusions and Transparency related Issues***

Recently a case was highlighted in the local news papers<sup>22</sup>, where the PM's appointed ex-adviser for the IT & Telecom sector accused his secretary and ministerial establishment for committing billions of rupees corruption, and their possible involvement in the fraudulent cases within his own ministry (MoIT). This case was particularly on the headlines because he was publicly declaring the so-called corruption cases happening under his own ministry; but accusing rather his secretaries for being involved in those cases of financial mismanagement. However, it has been reported in the

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<sup>22</sup> <http://publicmb.wordpress.com/2010/06/04/ppps-democratic-revenge-latif-khosa-and-abidi-insult-shout-at-it-executives/> (Accessed on January 24<sup>th</sup>, 2011)

news clips that this was actually a reaction from the PM's ex-advisor in retaliation of the denial of his secretaries and the board members of the USF Company, in accepting the advisor's appointed person as CEO of the Company. The board members denounced any such attempt to forcefully appoint a person without following the due course and formal procedure. It was further disclosed by media reports that the PM's ex-advisor actually wanted to appoint one of his own relatives as CEO for the two resourceful companies (which currently hold around Rs. 50 billion in their accounts as per the following report), known as Universal Service Fund (USF) and National Information & Communication Technologies Research and Development Fund (NICTRDF). These two companies were primarily created for commencing Research and Development (R&D) initiatives within IT and telecom sector, and for spreading the modern telecom services in under-served areas, in order to help bridging the existing 'digital divide'. The mentioned former advisor of PM was also previously stepped down from the Attorney General position under the Supreme Court's ruling on the alleged corruption charges; but despite the fact the current government appointed him later on as the governor of Punjab province. Most recently it has been reported in an authentic and largely circulated news paper<sup>23</sup> that the current government plans to make an amendment in the Telecom Reorganization Act (1996) in order to transfer the accrued funds of USF Company, which was legally bound to be only spent on the development of telecom sector; to a government's established fund named as BISP (Benazir Income Support Program) that has been widely alleged as being misused for political bribes and mass campaigning for political gains. These practices have raised severe questions and heightened concerns about the government's resolve in handling the cases related to financial transparency and unjustified intrusions; as the issue has been also referred within the recently published reports of 'Transparency International' whose activities were later restricted by the government.<sup>24</sup>

The government's influence on day to day operational issues for its own personal interests and financial gains has been recognized as a big threat and challenge by the telecom operators and other market players. As per the information received by the respondents (and also by the author's own observations during the interviews) the ministers often try to use their political power unfairly, e.g. by influencing the operators to rent their own recommended sites (for the antenna installation or the construction of their base stations); in order to be financially benefited and to also create jobs for their choice people without following the due procedures. The operators often do not dare denying these political interventions, out of the fear that they may possibly lose their other contracts (public tenders) and their already committed investments within the public sector; since those contracts and investments are then seen at risk if the operators strictly follow the standard procedures & defined codes of conduct. It has been mentioned that these unjustified intrusions and the followed up decisions under the political pressure often cause additional costs for the operators (what they had to bear considering it a form of bribe or commission, as paid to the political authorities and the local lords). It is especially valid when the designated coverage areas (installation sites) already have good coverage with no need for any additional site installations; or when the proposed sites are not located at the ideal location from the technical or commercial perspective.

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<sup>23</sup> Dawn (Islamabad) – report published on August 22, 2011

<sup>24</sup> <http://www.transparency.org/publications/publications> (Accessed on January 21st, 2011)



On this issue, MoIT defends its position by saying that the regulator was deliberately kept directly under the cabinet division to report PM, instead of reporting to MoIT; so that to reduce the chances for undue political interventions from the ministry in the regulatory affairs, by maintaining an arm's length interaction between the two entities. It is further told that MoIT only intervenes if it finds at any stage that the delivered policies are not being implemented within their genuine spirit, or if it finds a certain degree of deviations in translation. To counter that, MoIT issues a new policy directive as a corrective measure to erect the noticed deviation. However, it denies its engagement in any direct intervention on day-to-day activities either at the regulatory or the operational levels.

However, MoIT was informed about a case relevant to the transparency issue within an institution called Pakistan Software Export Bureau (PSEB), which was established under the IT division of MoIT. The bureau was given the task to facilitate the local software development houses and to extend their global reach by tapping new international markets for their developed products. In this case, the author referred to the complaint of a foreign-based software development firm, which was used to outsourcing its projects from the European countries to Pakistan in order to develop those projects at an economical rate. But, eventually the company decided to withdraw its investments from Pakistan due to facing high scale of corruption and bureaucratic hurdles; as allegedly created by the officials of PSEB themselves asking for the deliberate kickbacks and commissions; instead of providing any facilitation in carrying the operations. In responding to the above quoted case, MoIT did not exclude the element of corrupt practices, but did not want to comment further on it either. However it was told that the IT division is currently looking for an honest and competent director who could lead the actual intention of establishing this software export bureau.

### **6.3 The Licensing Process & Spectrum Allocation**

This section discusses the two important aspects of the spectrum management debate within the local context namely; the 'spectrum assignment' procedure as also known the 'licensing process', and the 'spectrum allocation' at an international and national level.

In order to understand the following debate, it is important to first comprehend the international framework which is used for the spectrum management under the direction of ITU. There are three terms commonly used in this connection namely; the spectrum allocation, its allotment and the subsequent assignment. The three definitions are quoted here from 'ICT regulation toolkit' which is jointly published by InfoDev and ITU (2007, pp. 19). "An allocation is an entry in a table of frequency, which sets out the use of a given frequency band by one or more radio communication services. An allocation is thus a distribution of frequencies to different radio services. An allotment is an entry of a designated channel in a plan in order to be used by one or more countries, or within the different designated areas/regions for a radio communication service under the specified conditions. An allotment is then the distribution of frequencies to different geographical areas or countries. Finally, an assignment is an authorization given for a radio station to use a radio frequency or a radio frequency channel under the specified conditions. An assignment is then the distribution of frequencies to a given radio station".

### ***Mechanism for the Spectrum Assignment (The Licensing Process)***

In Pakistan, initially there was only one authority called ‘wireless board’, which was responsible for the allocation of certain bands of frequencies for specific applications; and further the assignment of those allocated frequencies to different operators. After the Telecom act 1996, the wireless board was renamed to ‘frequency allocation board’ (FAB). It was informed by the operators that when Pakistan Telecommunications (Re-organization) Act-1996 was going to be enforced, the Ministry of Communication (now renamed to MoIT) wanted to keep some formal authority to exercise over the telecom market; hence the government decided to keep FAB under MoIT within the cabinet division. It was the time when an independent telecommunication regulatory authority (PTA) was about to establish and it was also kept under the cabinet division (like the other regulators). Hence, as per the Telecommunication (Re-organization) Act-1996, PTA and FAB are now considered as two parallel and independent bodies under the cabinet division.

Explaining the licensing procedure, the regulator and operators inform that in order to acquire a license for specific applications, the interested operator submits a formal request (application) against that the specific type of desired license to PTA. After following a due procedure, PTA issues the license to the applicant for the declared period of time. However, once the license is issued from PTA, the licensee is then also required to attain a spectrum (i.e. the assigned frequency slots or certain band of frequencies) in order to run its operations. At this stage then PTA channelizes the process by routing the applicant’s duly verified application to FAB. Hence, FAB finally confirms the availability of a vacant spectrum in order to be further assigned to that particular applicant after considering if there is any clash or overlapping of the requested spectrum with the already assigned different bands of frequencies. Here, apparently it seems like this extra channelization of re-routing the application from PTA to FAB may cause an unnecessary delay in the licensing process. The common logic also suggests that PTA and FAB should principally work under a single framework as part of a vertical structure, instead of being placed as separate or parallel bodies working horizontally. Ideally, the data available at FAB facility regarding the status of spectrum availability should also be made available to both the operators and regulator through the FAB’s online data sources. Therefore, it has been recommended that the licensing process should have been made further simplified by limiting the unnecessary routing of application, and minimizing the complicated bureaucratic procedures; preferably under the one unified and well-coordinated authority. The proposed structural and procedural reform would presumably help making the licensing process economically and procedurally more transparent and efficient.

### ***Mechanism for the Spectrum Allocation***

After discussing the mechanism for the spectrum assignment, here it seems relevant to also discuss the adopted procedure for the spectrum allocation in Pakistan. MoIT explains that spectrum is often allocated under two conditions; either when the desired spectrum is required for the new applications or when the interested parties contact FAB through PTA in order to make available those frequencies. The process has been assumed relatively easier when the requested bands have been already reserved (allocated) for those specific applications under the ITU directives (as mentioned within its published table of allocated frequencies); but the operators mention the fact that at occasions, even the ITU provided regulatory provision doesn’t essentially guarantee the

availability of those allocated frequencies for the specified applications under certain circumstances. It is because those bands of frequencies are sometimes already in use or pre-occupied by some transport applications such as the railway and airline services, public utility companies, or by the armed forces (military, air force, navy, security agencies) for their specific communication, signaling and defense/security related applications. The pre-occupation of frequencies was seen as a large barrier in their reallocation to those specific service applications for which they were originally allocated by ITU.

In order to resolve the bulging complexity involved in this issue, MoIT and FAB try hard to bring all the important stakeholders on board. In case, where the requested frequencies were already found in-use by another party for other unspecified applications, as per the ITU frequency table; FAB either asks the interested parties to apply for other available free slots or to pay for the losses and costs that would occur to the existing parties in shifting their current applications to other frequency slots, in order to evacuate the existing band of frequencies for the new requested applications. FAB also resolves (often in collaboration with PTA) the ‘interference’ related issues; those cases where the different licensees run their applications in close proximity to each other and in result their radio and wired installations may potentially cause interference for each other. It was also reported by some sources that when the technicians from the cellular and broadband wireless companies tried to investigate the reasons for the frequently occurring interferences, signal distortions and call drops during the delivery of communication services; then the investigation often ended up in finding the fact that those frequencies were already being used by some security agencies (even without the need for getting any prior permission or allocation from FAB for using those particular frequencies). Hence, in such cases again, the operators hold FAB responsible for assuring ‘site clearance’ for commercial operations; so that they could build their infrastructure and installations, and run their operations uninterruptedly without any interference, caused by either from other operators or from any unknown and unauthorized users. However, the operators here criticize that once the ‘site clearance’ has been issued to the operators by FAB, and they have already committed huge resources on their installations; then bearing these interferences at such a scale is literally unacceptable for them. They argue that if such interferences occur, then FAB and PTA should be able to show their authority to stop those guilty and unauthorized operators who violate the given regulatory instructions for running their operations on unassigned frequencies. The operators also argue that it is primarily the FAB’s responsibility to show its authority for evacuating the pre-occupied spectrum; instead of asking the operators to bear the cost of evacuation through giving financial incentives to the preoccupants of the assigned frequencies.

However, in order to clarify the situation further, a retired senior military official explains, that the need for an effective use of a ‘wireless board’ was felt when it was found that many organizations (especially the security agencies and the armed forces) were operating their different specialized equipments and applications on those frequencies which were not principally recognized or authorized by ITU for those particular applications. Hence, it became a serious issue when those frequencies were started being sold out and increasingly used on the commercial basis. The reason for the use of those frequencies for the military applications was given that the time since armed



forces were using those frequencies, the ITU's current frequency allocation table was not in place, and neither PTA did exist that time. On the other hand the 'wireless board' (now renamed to FAB) didn't want to bother with the armed forces either; probably for the obvious political reasons that historically no one dares in Pakistan to challenge the military 'say'. In addition to that, the security and armed forces had the problem of receiving their equipments, which were already designed to be used on those particular frequencies that were later disclosed as not being allocated by ITU. An interesting information was revealed that the US army when already realized back by the end of 70s that the new ITU regulation is about to be enforced, and US army itself couldn't use those military equipments in their own territory anymore; so they simply sold those equipments (or provided as part of the 'US Aid program') to Pakistani forces during the 'Afghan War' in 1980s, seeing that the new regulations were not yet in place there effectively. In this context, it has been presumed that probably the Pakistani government and the security forces were not fully aware of the consequences of that 'arms deal' in the long run.

In light of the above policy debate, the telecom operators were given the choice to additionally pay for the compensation of the equipments of the evacuees in order to move their operations to the new allocated frequencies; hence to convince them evacuate those pre-occupied frequencies to make them available for the civilian and commercial applications. The rationale behind that decision was the argument that those who need the requested frequencies the most should also bear the additional cost of compensating the expected losses that were assumed to be occurring in shifting the evacuees' operations to the new frequency slots. It was informed by the senior consultant of an operator that finally the consensus was reached between the different contending stakeholders, while agreeing on the term that the cellular operators would pay the additional cost to compensate the losses of the evacuees in order to use those frequencies for the commercial applications. Was that a logical and justifiable solution; or actually the only strategic choice left for building a consensus between the engaged stakeholders? That is however, an open and debatable question.

#### Noncommercial and Unlicensed Bands

Finally here it seems relevant to also briefly discuss some of those bands of frequencies which are allocated for noncommercial applications such as ISM (Industrial, Scientific and Medical) and U-NII (Unlicensed National Information Infrastructure) under the terms and conditions of unlicensed bands. The ISM and U-NII bands are dedicatedly used for the mentioned non-commercial applications. Even though internationally these bands have been increasingly acknowledged and given proper value; however, these unlicensed bands have not been properly allocated or brought in effective use in Pakistan so far, as per the information provided by the operators. ISM bands are generally confined within the range of 900 MHz and 2.45 GHz,<sup>25</sup> and are also used by the Wi-Fi (802.11b, 802.11g) and Bluetooth devices. These bands are also used by a variety of non-computing devices, such as cordless phones, low-power light bulbs, garage door openers and microwave ovens. Whereas the UNII bands locate at the higher range frequencies such as 5.15-5.35 GHz and 5.725-5.825 GHz range; and these frequencies allow higher data rates through Line of Sight (LOS) communications. However, research shows that LOS communications are highly susceptible to the

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<sup>25</sup> MHz and GHz stand for Mega Hertz ( $10^6$  Hz) and Giga Hertz ( $10^9$  Hz) respectively

presence of physical obstructions in between the line of sight communications between the transmitter and receiver; such as the office walls, cubicles, desks and even people.

The reason for the relatively less effective use of these bands in Pakistan has been commonly linked with the relatively lack of awareness, and in result the low demand for such applications. Hence, no major investments or any serious initiatives have been committed so far in this direction either by the public or the private sector. In result, there has been a marginal use of these bands for different applications such as the Citizens band (CB) radio, Family Radio Service (FRS), Walkie-talkie (push-to-talk), ‘extended’ cordless service, and business band. However, the Terrestrial Trunked Radio (TETRA) system is already in use of the Police, and probably also in use of the radio taxicab services in Pakistan. On the other hand, the other non-commercial applications include the military applications which mostly operate at VHF, UHF and SHF<sup>26</sup> bands of frequencies (ranging from 30 MHz to 30 GHz), which include mainly the terrestrial radio, Radar (microwave) and satellite applications. The ministry explains that the frequency allocation for such bands is also made as per their requirement; either when the need is felt or when a request is made by a third party, and only then FAB allocates the required frequencies in light of the frequency table as provided by ITU.

#### **6.4 Licensing Policy – The Possible Timeframe for 3G Licensing**

The adopted licensing policy and its efficient implementation by policy making and regulatory institutions does play a crucial role in the subsequent diffusion of the respective telecom services in any focused market. Different approaches have traditionally been adopted with respect to the licensing policy namely: lottery, administrative assignment, auctioning, and ‘beauty-contest’ based licensing procedures. But particularly in case of cellular telephony; there has been observed significant split within the policy debates on the adoption of two leading approaches i.e. auctioning and ‘beauty-contest’. In many countries the current delay in 3G licensing has been observed primarily not because of encountering technical issues with respect to the deployment of the new services; but it is because of their respective governments’ high hopes and expectations to squeeze as much money as possible from the licensing process. Hence, the main concern and the bone of contention behind all the policy debates about the adopted licensing policy seems to be essentially circulating around the government’s level of interest in raising capital through the licensing process; and thus the resulting impacts of the mounting costs of acquiring licenses on the rapid and smooth diffusion of telecom services. Hence, the global telecom policy makers are apparently split in two major groups. One group is in favor of ‘auctioning’, considering it a filtering test to judge the relative interests and the financial strengths of the applicants in carrying out the subsequent deployment once the license has been awarded; in order to deliver the services in the shortest possible time to quickly recover the committed resources spent on the acquisition of licenses. On the other hand, the other group actively supports the idea that the licenses should be awarded not just based on the applicants’ financial strength, but more importantly following other major criteria as well; in order to judge the relative competence, commitment, efficiency, and viability of the proposed plans regarding the forthcoming networks deployments for the delivery of services.

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<sup>26</sup> VHF, UHF & SHF stand for Very High Frequency, Ultra High Frequency, and Super High Frequency respectively

Hence, as discussed above, even though the 3G services are already made available in most of the developed countries for a decade from now; in many developing countries even the licensing process has not been yet initiated for several reasons. Even though the policy and regulatory institutions, and also the operators forward a range of arguments for this delay; but the current delay seems to be primarily due to the fact that the operators are not ready to pay in the current market conditions the expectedly very high amount of licensing fee to acquire 3G licenses, as also observed in the case of Pakistan. About 3G licensing, PTA comments that it is all up to MoIT to decide the timing and procedure for the proposed licensing; however PTA's role is assumed to start only once the final policy has been handed over to PTA from the ministry for implementation. The regulator informs that MoIT has already sent the summary for 3G licensing to the cabinet division for the final approval. PTA considers that with the deployment of 3G networks, the competition will also increase in the broadband wireless market due to the competitive entry of mobile broadband services with relatively a larger bandwidth available, which will expectedly result in an enhanced quality and reasonably reduced prices, as compared to the current market conditions.

The following discussion has been divided in two sub-sections: first sub-section discusses the bottlenecks and barriers which cause the current delay in the 3G licensing process, and also discusses the expected timeframe for 3G licensing in Pakistan; whereas the second sub-section compares the rationale of currently adopted licensing policy (i.e. 'auctioning' through bidding process) with the 'beauty-contest' model that was generally preferred by most of the respondents.

### ***The Bottlenecks and an Expected Timeframe for 3G Licensing***

The Mobile Cellular Policy (2004) clearly indicates that the anticipated time line set for the introduction of 3G (third generation mobile services) in Pakistan was actually the early 2006; hence the 3G licensing is now already 5 years delayed from the scheduled time of licensing. However, the current circumstances indicate that even the possible timeframe for 3G licensing has not been yet decided. The respondents were asked about the major reasons for the current delay in 3G licensing. In response, MoIT comments that the primary reason for this delay is the unavailability of the spectrum requested for 3G services within 2.1 GHz range. It has been informed that the requested uplink and downlink frequency slots in this range are already in use of different public sector and semi-governmental entities such as the military (armed forces), Water & Power Development Authority (WAPDA), PTCL and Gas supplying companies. These public and semi-public entities take their own stand on using these frequencies; for example, WAPDA argues that its DRS links on these frequency slots are critical for their operations relevant to the 'load-dispatch management system'. MoIT informs that the negotiation with these public sector bodies are going on; however these entities argue that they cannot move their operations to other frequencies since such shifting would require huge resources in order to buy the new equipments accordingly, which the current government cannot afford to compensate at this stage of its financial crisis. Nevertheless, MoIT is determined to resolve this issue; so that it could call for 3G licensing if the other variables were also found in favor.

Due to the above mentioned fact, the 3G broadband services will be deployed gradually, while targeting initially the 12 largest cities followed by the other 38 major towns; whereas rest of the country would be covered accordingly as per the level of demand for the new service in rural areas. Hence the requirement for the evacuation of those occupied bands of frequencies would also require to be completed gradually in phases across the country, as explained by MoIT. The operators' planned strategy for 3G network deployment also seems in line with the above mentioned spectrum evacuation plan i.e. in the first phase, they plan to only target the major metropolitan cities followed by a gradual extension to rural areas as the demand for these services would gradually grow over the years. Thus the operators would make subsequent deployments; and hence would commit further resources based on the capital and experience earned from the first phase of deployments.

MoIT explains that there is also a possibility of providing 3G services in other bands of frequencies such as in the range of 3.4-3.6 GHz, where WiMAX is currently operating in Pakistan; however, it was informed that the military applications are already using these frequencies as well. In addition to that, the current cellular operators are also expected to fiercely oppose any such move towards considering 3.4-3.6 GHz band for the future deployment of 3G services; since in that case the cellular operators would simply lose their businesses to WiMAX operators if they also acquire 3G licenses. Furthermore it would cost huge amount of resources to the cellular operators to redeploy their networks in order to make them compatible with the new range of frequencies. On the other hand, in case of providing 3G services at 2.1 GHz band, the cellular operators would only need network up-gradation, which is relatively a soft transition from their existing GSM networks towards WCDMA<sup>27</sup> based 3G network. Since currently all mobile operators are operating on GSM network; hence a possible shift to SOFDMA<sup>28</sup> based mobile WiMAX (802.16e) network for the provisioning of 3G services at 3.4-3.6 GHz band of frequencies would cost them prohibitively high amount of resources, what they are very unlikely to support it. This definitely makes sense that's why the current cellular operators are expected to only push for 2.1 GHz slot for 3G licensing.

The above discussed issues have been raised by MoIT in the FAB's board meeting in order to find out some middle way for evacuating the preoccupied bands of frequencies in order to make the commercial use of those frequencies possible, especially for the 3G and wireless broadband services, as informed by MoIT. The situation has been called grave particularly when considering the current delay in the deployment of 3G services, and the very limited use of broadband services in the country. It has been indicated that a common agreement and a mutual consensus among the market players exist, that the broadband and cellular services need to be further developed and proliferated considering the immense economic and social benefits of these services. The wireless broadband access has been viewed as the only viable option for the countrywide service deployment and access provision, particularly in context of Pakistan. It is for the obvious reason, that the fiber connectivity (FTTH) has been generally considered too costly solution to be proposed for a developing country with very low consumer's purchasing power. On the other hand, DSL (Digital Subscriber Line) has been considered an insufficient access solution to support the country's future

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<sup>27</sup> WCDMA stands for 'Wideband Code Division Multiplexing Access'

<sup>28</sup> SOFDMA stands for 'Scalable Orthogonal Frequency Division Multiple Access'

need for broadband services; knowing the fact that there is no further copper deployment plans by the fixed or broadband operators, whereas the condition of existing copper network has also been reportedly deteriorating day by day due to the lack of maintenance. In addition to that, the wireless broadband solution such as mobile WiMAX has been internationally considered as one of the strong candidate for providing the compatible platform to launch 4G services. Hence, SOFDMA based mobile WiMAX (802.16e) has been seen quite comparable to its dominant contender i.e. the WCDMA based LTE (Long Term Evolution) technology, for delivering the 4G services

Despite the commonly felt need for the proliferation of 3G and wireless broadband services in the country within 2.1 GHz and 3.5 GHz bands of frequencies; the requests sent by MoIT to FAB to relinquish the preoccupied use of these frequencies from the unspecified applications in order to assigned them for different civilian and commercial applications, apparently seems to be yet unfruitful. However, the ministry was reluctant to loudly acknowledge the fact that the major bottleneck in this case has been so far the overwhelmingly dominant and influential role of the security forces in the country affairs, even also in case of purely civilian and commercial matters. Ideally, the licensing policy and following procedures should have been planned and executed all independently by FAB on the merit basis, and in consultation with MoIT, PTA and other relevant stakeholders under the directives of ITU. In this regard, a reform initiative is required under the lead role of government in order to convince the different public entities to move their unauthorized applications to other frequencies, and follow the guidelines provided by ITU and FAB. Government needs to plan for the gradual evacuation of those preoccupied frequencies through partially bearing the essential cost of the replacement of incompatible equipments and other installations.

MoIT acknowledges that the cellular operators have shown their high concerns and lack of interest in the expected 3G bidding process at this stage, until the other critical factors have been properly addressed such as: market readiness for the new technology i.e. the users' relative awareness, existing 2G market saturation and maturity, customers' willingness to additionally pay for the new services, recovery of the operators' current financial losses due to decreasing ARPUs, and a certain level of market stability in the currently prevailing political uncertainty and bad security conditions in the country. The operators further argue that no investor, in the existing prevailing political, economic and security conditions, would ever consider investing for 3G licensing, and in the follow up network roll out for the deployment of 3G services.

About 3G licensing, the operators consider that it is not up to the operators' or any other authority's decision to announce when to conduct the licensing process and to launch these services; but in fact it is up to the 'market forces' (i.e. a fine tune between the supply and demand-side economics), that actually define whether or not the market is ready for the new product or technology, such as in case of 3G services. The operators consider that the licensing and the subsequent growth in the deployment and diffusion of a telecom service is primarily driven by the market needs that indicate the users' desire for the new services, thus considering the supply and adoption of new services fundamentally a demand-driven phenomenon. They view the recent phenomenal growth within the cellular mobile market a reflection of the market's genuine need and demand for the cellular voice

service. However, considering the existing market conditions, where the illiteracy, usability and affordability are considered among the major retarding forces in the effective and rapid adoption of new services, such as the broadband and 3G mobile services; the desire and appetite for advanced services is relatively quite low.

The operators mention that an overwhelming majority of the mobile users in Pakistan even don't know the need and the proper use of the existing mobile features and its different functionalities as currently supported by GPRS and EDGE (2.5G) services, apart from using their mobile phones merely for making or receiving ordinary voice calls. Hence, the operators question how come the existing mobile users are presumed to adopt the 3G compatible costly handsets with expectedly 2-3 times expensive service charges? Following the above line of argument, the operators view the current market not yet ready for 3G services. Given the bad economic and law & order situation, and very low awareness and affordability among the masses; the operators assess that it will still take about 5 years before the market would possibly get ready for 3G services. Hence, the operators plan to keep lobbying against the 3G auctioning until the market is fully ready for those services.

In line with the operators approach on the subject, the author further adds on the argument that an investor only invests the money when there is a certain degree of surety or at least a higher probability for a reasonable return on investment; in order to make a sound business case for the proposed investment. The factors which make the business case, and eventually convince an investor to commit the limited resources in a particular market are: the presence of an actual need and appetite for the new product or service, the market's affordability factor, its relative awareness and usability elements, the consumer's willingness to pay for the new service, and the market's overall stability for a sustainable growth. These above mentioned factors, however arguably seems absent in case of the local telecom market, as considering both the supply and demand-side business dynamics. In result, the foreign investors who were backing the existing telecom operators are now more interested to invest in other regional countries such as Bangladesh, India and Sri Lanka rather than committing their investments in Pakistan, as argued by the operators.

The operators are principally willing to commit their resources for the deployment of 3G services in Pakistan, if the business case exists. The cellular operators are definitely interested in acquiring an increased spectrum for launching the advanced services; but not in paying the excessively high licensing fee for acquiring those 3G licenses. They consider that if 3G licensing was announced at this stage, it would be like pushing it on them forcefully. In this context, they argue that the local market requirements cannot be compared with the technologically advanced countries both from the relative market's awareness perspective but also from the affordability point of view. So the local telecom market has to set its own benchmarks and trajectories in order to compare with the other regional countries having similar social, economic and technological contexts. Following this line of argument, they conclude that they should not aim at launching 3G until the market for 2G is sufficiently saturated, and thus signals for its readiness to consume 3G services.

Furthermore, the cellular operators argue that 3G licenses should only be issued to the existing 2G operators, since they view that it will only suit to the current operators to carry on their task as voice and data carrier on 3G networks; since they already have the installed capacity and necessary experience of delivering the cellular services. Whereas they consider that the induction of new contenders into 3G market would likely to destroy this already a fiercely competitive market, which would eventually result in raising further issues relevant to the rights of way (RoW), environmental impacts, infrastructure sharing, incompetent entries, increased interference, maintaining QoS, and an additional decline in the ARPU, hence resulting in further reduced profit margins. They argue that the existing operators have the basic infrastructure (cables, towers, switches, backhaul links etc.) and premises (cell sites, RoW etc.) available, which can easily be upgraded (from GSM/2G to WCDMA/3G); hence it will be considered relatively much smoother migration for them, as compared to a new operator.

#### *Licensing Procedure - 'Beauty Contest' vs. 'Auctioning'*

Internationally two major licensing procedures or methods have been widely acknowledged and adopted namely: the 'beauty contest' and 'auctioning' (Intven, 2000). There have been heated debates on the viability and rationality of these two approaches, while comparing the merits and demerits of both approaches from different perspectives. In this sub-section, the debate has been viewed within the local context to judge the relative viability of these competing approaches.

Collectively, the respondents were found in favor of 'beauty contest' approach for the licensing, particularly in context of the current economic recession and changing market dynamics. Furthermore no cellular operator was found ready to go for 3G licensing based on 'auctioning' of licenses through the bidding process at high prices in the current conditions. The operators presume that the government expects to fetch a billion dollar from the forthcoming 3G licensing process, as benchmarking with the neighboring country India and the other EU countries. The operators assume that a common understanding exists among the regulator and the existing cellular operators that there will be only three licenses issued for launching 3G services in Pakistan. They further assume that the government expects to sell each of these 3G licenses at around \$300 M, somewhat similar to the prices they sold out the 2G licenses back in 2004-05; however, the cellular operators would be barely willing to pay around \$150/200M for each 3G license, as described by the operators.

The operators further argue that even though if an initial understanding establishes between the operators, ministry and regulator to auction each license at around \$200M, the total raised sum from the three successful operators for only the 'licensing' part would be around \$600M. Whereas, in addition to that at least around \$300M would be required by each existing operator for the infrastructure building, network up-gradation and the countrywide rollout of 3G networks; hence, making an additional total sum of \$900M on part of the 'network deployments'. In result, collectively it would require a total lump sum amount of around \$1.5B investment from the three operators (i.e. around \$500M per operator) in order to realize the availability of 3G services in Pakistan. However, fetching the above presumed scale of investment for launching 3G services in the current economic conditions and market situation has been considered quite an unlikely

scenario; since the 2G market is still unsaturated and facing a head-to-head fierce competition among the existing five operators with continuously shrinking ARPUs and further depleting profit margins, as reported by those operators. However, it is only one side of the story; on the other hand, the poor banking sector and the private investors (VCs and ‘business angels’) also seem to be unwilling to lend this big amount of loan (or commit such a huge investment) in the presence of current market uncertainty and high level of risks involved in this venture, in order to realize a reasonable returns on their investments within a given timeframe.

The cellular operators recommend that 3G licenses should be provided preferably through ‘beauty contest’ at nominal fee, or at considerably low prices even if it had to be auctioned anyway. However, the existing operators fiercely oppose the induction of any new licensee in the cellular market, and demand for issuing the forthcoming 3G licenses only to the existing operators; since they already have their countrywide footprints, an operational experience and the relevant expertise to effectively deliver the new services within a short timeframe. Due to the current economic recession and unfavorable market conditions, the operators insist on government to not hope for fetching huge capital through licensing process and they advise the government to find other sources of revenue for controlling their budget deficits. They argue that the government is already receiving huge amount of taxes from the telecom sector, mainly from the cellular market. However, they presume that MoIT apparently doesn’t seem to be quite convinced with their line of arguments.

Responding to the operators’ concerns, a senior respondent of MoIT reflects a true picture by saying that the ‘beauty contest’ has been generally considered a more viable choice for the developed and socially welfare states such as Japan, Finland and Sweden, which were actually more concerned about the fast proliferation of new services for their social welfare and industrial growth; instead of starving for the ‘hard cash’ from this so-called a ‘facilitating’ (licensing) process. On the contrary, in the poor developing economies like in case of Pakistan, the licensing process has been understood from a different perspective. They have considered the spectrum as a ‘scarce resource’ and ‘national asset’, which was presumed to be sold out in the best available market price like selling a commercial commodity to earn money out of this process in order to support the national economy; regardless of the fact whether the licensing revenue would be spent back on the sectoral growth or would be used for reducing the national budget deficit or covering the government’s overhead costs. Hence, the primary interest of the government here has been remained to extracting as much revenue as possible out of this ‘cash cow’ for the government’s running expenses. In line with this second perspective, then the ‘auction’ seems to be more suitable option since it better serves the desired purpose of licensing in Pakistan. Hence from this vantage point, auction apparently seems an ultimate choice for the government and policy makers to let the market forces determine the real worth of the spectrum through spectrum’s trading or bidding process, just like a ‘commercial commodity’ is traded in an open market.

The operators also ironically agree with the above line of argument saying that the “licensing procedure follows the licensing mission”. If the mission is to flourish the new technological platforms and a rapid diffusion of delivered services among the masses, then the licenses should be



provided on competitive basis with reasonable terms and conditions that suits for the fast proliferation of services, either through auction or beauty contest. However, keeping in view the government's overwhelming financial interests in the licensing process, the operators already presume that 3G spectrum would be assigned through auction; since Pakistan is intrinsically an 'auction based regime', where the thirst is for short-term profit reaping. Hence, here the dominant rationale of immediate revenue collection through auctioning clearly outweighs the long-term strategic and economic benefits that underpin the rationale of adopting 'beauty contest' approach.

MoIT further argues that the last amendment in Telecom Act (2006) demands that "all the revenues generated by selling the spectrum should principally go to the USF fund in order to be spent on efforts to bridge the existing widespread 'digital divide' in the country". But 'in reality' the ground facts may present quite a different scenario; hence, the interest-driven and politically-motivated unwanted interventions, and the cases of financial mismanagement may even cause to further harm the existing stumbling efforts to bridging the digital divide. However, the operators' point of view is quite clear in this regard, as they strongly demand the licensing fee to be spent back on the development of telecom sector. They complain that in practice the raised capital from licensing fee has been often used for quite irrelevant purposes. The cellular operators mention that according to the current amendment of Telecom Act (2006), "the license fee is not supposed to be all going to USF"; hence the operators' stand here apparently seems quite in contradiction of the MoIT's statement, as both referring to the same policy document. It reflects how the varying translations of the same text can be used to promote a specific agenda. It also reflects how the differing translations in theory and in practice may substantially take different shapes, in result of the deliberate manipulations and the distortion of meanings as per the different actors' specific interests.

About the forthcoming 3G licensing, the adopted procedure by the licensing regime in Pakistan can also be a blend or a 'fine mix' of the two prevailing licensing approaches namely: the 'beauty contest' and 'auctioning'. For example, the licensing process may follow two sequential phases: where in the first phase, the process may adopt the method of 'beauty contest' in which the applicants' technical, financial and commercial capabilities and competencies can be judged through their past records and experiences, in addition to the evaluation of the submitted proposals; whereas in the second phase, the selected candidates of the first round of selection may be asked to participate in an open and multi-round bidding process where a moderate bottom-line auction price could be assessed by an unbiased panel of market experts following an in-depth pre-auction market analysis. Hence following the above hybrid procedure, the winners of both phases should be subsequently assigned the licenses, with mentioning clear deadlines to achieve the declared targets.

In this context, the recently completed 3G licensing process in India can be followed as a 'role model' or a source of inspiration for designing a localized version of this reportedly<sup>29</sup> a success story in the Indian context of 3G licensing process. The licensing in India was completed in May 2010, where the 3G licenses were sold at auction on the regional basis (22 regions or circles) among

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<sup>29</sup> <http://www.cellular-news.com/story/43395.php> (Accessed on January 22nd, 2011)

7 successful competing operators. The bidding was completed in 183 rounds over 34 days which collectively fetched \$14.6 billion. Surprisingly, none of the bidders have walked away with a nation-wide license. The interesting point about the adopted procedure was that the costs of licenses for rural regions were considerably lower than the urban regions which compose the rich financial districts and metropolitan cities. Hence, in result of such 'differential pricing' scheme, an interesting pattern appeared showing that in every region only three or at maximum four licenses were issued; so that providing a reasonable ground for a moderate and balanced competition among the competing three operators on the regional basis. In Pakistan, a somewhat similar model was adopted in case of LL (Local Loop) and WLL licensing, where the licenses were issued on the regional basis among several contenders within the specified 14 telecom regions.

However, the author highlights here a potential risk of an unconscious use of the beauty contest method for licensing, as it is also in line with an operator's heightened concerns on that issue. The use of 'beauty contest' method, particularly in context of a developing country like Pakistan, may have a potential risk of ending up in a corrupted process; in result of being unfairly used in favor of the relatively powerful market players, possibly through a 'collusion' between some of the operators and the key government officials, after agreeing on the kickbacks (or commissions) to preset an 'under the table' deal. Due to facing relatively a higher scale of corruption and lack of transparency in the country, and also due to the higher scale of subjective judgments involved in this method; depending only upon the 'beauty contest' method for licensing may jeopardize the very essence of the whole process. However on the positive side, if the licenses were issued based on beauty contest, the operators would likely be more determined to spend the saved money in terms of the 'licensing fee' (otherwise a 'sunk cost') for the rapid development of infrastructure and an extensive network rollout, which would also likely ensure a faster connectivity, better coverage, and an improved QoS at more competitive prices. Hence, the author recommends the government to not attempt achieving one policy objective at the cost of other; and rather it should bring a fine balance between the two policy objectives namely: the social and economic objectives, as also discussed by Melody (1997).

The author further argues here that, the 'beauty contest' is considered to be a way to give a fair opportunity and an equal chance to all market players to compete on the ground of their relative 'innovativeness'; instead of blocking the competitive entries using the 'financial muscles'. Since the acquisition of licenses at huge cost is another way of creating unbridgeable 'entry barrier' for the new entrants coming with relatively weaker financial capacity; hence the auction-based licensing method may be used as an instrument by the existing market players to maintain their status quo and the existing 'oligopoly' in the market. The auctioning of license at huge cost is also considered as a strong barrier in realizing the implementation of a 'user-centric' and 'technology-neutral' regime with its genuine spirit, which aims at creating a multi-technology and multi-operator landscape for the delivery of a range of telecom services to the end-users at competitive terms. On the contrary, it has been primarily the financial concerns including the license fee issue that actually convinced MoIT and PTA to stop WLL operators providing the roaming facility; to stop WiMAX operators coming into cellular business and delivering the voice services as well on competitive

terms; and to stop the broadband operators providing the VoIP (Voice over IP) services. It is here assumed that if the license fee issue would have been removed from the equation; then it is much likely that we would observe a higher scale of innovation-based competition among a range of telecom operators delivering a whole portfolio of competing VAS using multiple communication networks, which would in result benefit both the telecom industry and the user market. The users would benefit out of this proposition due to having multiple alternative solutions to choose among from the most competitive option, which suits best as per its specific context of usage and requirements within the restricted budget.

## **6.5 Telecom Reform – The Deregulation, Liberalization & Privatization Processes**

Following the international trend of AT&T divestiture (Melody, 1997) in US by FCC, and then its resulting impacts all across the world's telecom markets; the government of Pakistan also decided to open up the telecom market for the new telecom services, starting with issuing the licenses to cellular operators in early 1990s. But the real growth in the mobile sector was unrecognized and not even worth to be mentioned until the beginning of new era in 2003/04 when the cellular market was essentially liberalized and deregulated in result of issuing further licenses to three foreign operators. In the meanwhile, the sector deregulation and liberalization process was completed under the supervision of World Bank and ITU in consultation with a Canadian law consortium, who were assigned the task to open the local telecom market for competition, curtail the incumbent's monopoly, help in drafting the relevant policies, and making recommendations for the government on different policy matters. Followed by the deregulation and liberalization policies as they were primarily focused on the fixed line sector, the cellular mobile and broadband policies were also announced in the mean time to set the course for the telecommunications industry in Pakistan.

### ***The Conflicting Perspectives of Stakeholders on the Resulting Impacts of Telecom reform***

The impacts of telecom reform initiatives have been assessed quite differently by different stakeholders. Generally the positive impacts of these reform initiatives have been widely observed and acknowledged in the cellular market due to experiencing an unprecedented growth both in terms of unparalleled investments and an extensive network rollout, but also in terms of a phenomenal growth in number of subscriptions. However, that scale of impact could not be witnessed in case of the fixed line and broadband services to any comparable extent.

With respect to the issued policy documents under the telecom reform movement, the operators raised their concerns primarily not about the original spirit of those policy documents, but actually they showed their high concerns whether the vision and objectives declared in those policy documents were properly translated, and hence did they achieve the set goals on the ground level or not? And how the documented policies and the written texts were actually unfolded in the field, and in what shape? Are they really successful in liberalizing the economy and ending up the incumbent's control and monopoly regime over the essential facilities to envision a free and fair multi-operator and technology-neutral competitive market, particularly in case of the fixed line and internet markets? The operators further argue that merely by distributing the licenses to collect the hard cash from them would neither help creating competitive markets nor would help growing the

markets? It has been further argued that the telecom markets and consumers would only get benefit in the real term if there is created a balance between the demand and supply; and if the licensees are properly facilitated in overcoming the bureaucratic hurdles, which they frequently face while dealing with: the fixed line and broadband incumbent during the interconnection process; the large operators in infrastructure sharing; and the local governments and municipalities in getting RoW (rights of way) for the network rollout.

On the contrary, the regulatory authority and telecom ministry portray quite a different picture while shedding light on their achievements with respect to the ongoing telecom reform process and its resulting impacts on the telecom sector. MoIT claims that the effective implementation of the reform initiatives and their resulting outcome in case of Pakistan has been frequently quoted internationally as an exemplary 'success story'. MoIT is currently focused in providing a transparent and facilitating policy framework in order to encourage the local and foreign investors to invest in the telecom sector. MoIT and PTA claims that the recent entry of many new telecom operators in the mobile, fixed and internet services' markets indicate the sector liberalization, and also shows the investors' level of confidence on the policy and regulatory regimes.

MoIT argues that the previous five years' cellular policy 2004-09 did work quite well, as it could be witnessed by the recent growth what the mobile sector has experienced in result of following the outlined cellular policy. However, it was acknowledged that the cellular and broadband policies were due to be revised soon, and the revision would be made in the new context while keeping in mind the changed market dynamics. It was assured that MoIT would consider introducing new reforms in the forthcoming IT & Telecom policy by giving more flexibility to the new entrants in getting flourish, and by curtailing the regulatory interventions on day to day business operations. It was further told that the revised cellular and broadband policies would determine the future course of action, if properly implemented to produce the anticipated results. It was acknowledged by the ministry that the data operators had high expectations with the forthcoming revised broadband policy, that it would produce the same 'magical' effect with the positive results as were observed in case of the diffusion of mobile services.

The regulator further explains that in order to move towards creating competitive markets, two operators were declared as SMPs (having 'Significant Market Power' or generally also quoted as incumbents); i.e. PTCL for the fixed line and internet sector, whereas 'Mobilink' for the mobile sector. PTA calls it the result of the liberalization process that we currently witness in form of an increased competition with decreasing tariffs in the mobile sector, which eventually benefits the end-users, with more competitive choices available for them. MoIT also follows the same line of argument saying that, the result of adopting WTO reform process through privatization, deregulation and liberalization of the telecom sector resulted in an increased foreign investment and competition in the sector, which helped in experiencing a phenomenal growth in the mobile sector, as making the mobile teledensity drastically raised from previously 3% to now above 65% in just 7 years period of time. MoIT further argues that the increased competition due to the entry of new

players and ensuring a level playing field for all telecom operators helped in remarkably bringing down the cost of telecom services over the past few years.

In the above context, the author considers that gradually the balance of power and the market dynamics seems to be now shifting from the public monopoly (as observed in case of landline telephony and narrowband internet services) towards more competitive private sector market players (as observed in case of mobile telephony, WLL and broadband services), in result of an ongoing market reform process. Furthermore, the government's too much focus on promoting the mobile service and relatively ignoring the promotion of fixed line services has resulted in the gradual replacement of the fixed line demand with the mobile services. In this connection, a telecom vendor argues that the cellular licensing process could have been delayed for sometime in order to have first achieved reasonable growth in the fixed line sector, with the help of private investments, which instead then mostly diverted towards building the mobile and wireless broadband infrastructure; in result the telecom reform initiatives couldn't reasonably benefit the development and growth of fixed line sector in the country.

On the changing environment in result of an ongoing telecom reform process, the fixed incumbent PTCL reflects on several issues with its own stand point. PTCL puts forward its perspective by saying that "these are the norms of telecom sector as observed commonly all across the world these days, and every where the deregulation and liberalization process has been either successfully completed or is under the process. PTCL is definitely preparing its means through experiencing and adapting the ongoing 'change' in almost all the segments of its activities such as marketing, HR (Human Resources), commercial activities, operations etc., whatever you take; and that requires the change of skills and competencies, change of attitude and relations with the customers, and the way services are being delivered. So the change is under its way but for a government controlled entity like PTCL it would still take some time before realizing the full effects of the taken reform initiatives, and thus to fully adopt the changed environment accordingly. However, PTCL does not react to these ongoing changes in a negative way, but rather with a positive attitude; but the adaptation is itself a continuous process. Hence, even though PTCL has not yet reached to an optimal level of adapting these changes, but it has definitely adapted to the changing conditions to a certain degree." PTCL realizes the fact that the local telecom market is becoming fiercely competitive in terms of the increasing number of players and consumers, and also an increasingly unmet demand with growing expectations and awareness among the telecom consumers regarding the quality of service and prices.

Commenting over the frequently observed demonstrations and strikes by PTCL employees and labor unions against its administration on several controversial decisions taken in the past, especially as experienced after its privatization; PTCL explains that "these protests and demonstrations by the labor unions and employees are not something unique in case of Pakistan and we do observe these demonstrations and strikes all across the world, even in the developed countries as well." PTCL insists that these demonstrations have nothing specific with the privatization process that in fact successfully took place; since even before the deregulation and

privatization process there were used to be strikes and demonstrations. But in this specific context, it has been wrongly translated by the outside world by portraying these incidents as the ‘aftermath’ of sector deregulation and PTCL’s privatization process; which is a wrong perception and has been deliberately propagated by some corners for their own political agenda, as told by PTCL. The fixed and internet incumbent further argues that “it is natural that when you move from monopoly and incumbency to becoming a more competitive, liberalized and deregulated entity; there would be issues raised in result of these changes e.g. in the HR restructuring, compensation packages, and the requirements for a new set of skill and assignments. Accordingly, in this changed and new environment, there is required a new style of management; and hence newly adopted organizational practices as well, so this situation should not be evaluated in terms of an increased or decreased bargaining power of the labor unions. In result of this ongoing change, the labor unions would also have to adopt the new realities of the changing environment.”

### ***PTCL Privatization***

The privatization of PTCL has been commonly considered as among one of the most controversial telecom reform processes conducted so far in Pakistan, due to the involvement multiple interests in this process. There were heard many voices in the print and electronic media from different corners of the society, as challenging the rationality, legitimacy and transparency of the privatization process. The author here presents those conflicting perspectives in order to highlight this issue from different angles and vantage points.

The telecom operators considered the adopted bidding process during the privatization of PTCL as justifiable and transparent. They generally responded in favor of the process, while also arguing against some of the myths which were probably spread deliberately by different corners in order to overshadow the legitimacy and transparency of the conducted process. They explain that the one shot, simultaneous and sealed bidding process, as adopted in case of PTCL privatization was more suitable in the local context, as compared to multiple round and sequential bidding process where the subsequent bids are raised and forfeited throughout the bidding process (and often made visible on an electronic screen) and that has been previously practiced in developed countries. However, it was argued that the local environment due to its specific socio-economic and political dynamics was not yet ready for that type of an open and multiple round bidding process. It was further informed that initially 18 investment parties were interested to bid for acquiring the offered 26% strategic shares of PTCL, but the number of bidders gradually reduced after the first stage of filtration process of the received applications, as only 9 of them could have reached to qualify for the second phase. However, in the end only three head-to-head competing bidders were left to qualify for the final bidding. The final bidders were China Mobile (world’s largest mobile operator), SingTel (Singapore Telecom) and Etisalat (UAE based Telecom Company).

It was further informed that before the final bidding had actually taken place, there was made an assessment by an expert group for the evaluation of a fair value share price, which stuck around a value Rs. 56-58 per share. The offered bid by SingTel and China Mobile were around in between Rs. 60-62 per share, which was thought to be quite expected in light of the initially evaluated ‘fair

value assessment'. Surprisingly the UAE based company Etisalat bid for a value Rs. 117 per share, which was no match to others; hence Etisalat was declared as winner of the 26% strategic shares by paying an amount of \$2.6 B with exclusive management rights of both the fixed incumbent PTCL (including its subsidiary the largest ISP in narrowband internet services), and the second largest mobile operator of that time as officially called PTML but operating with the brand name of 'Ufone'. Eventually, a lump sum amount was agreed to be paid as an upfront apart from the initially submitted security deposit, while the rest had to be paid in installments in the forthcoming years after taking the control and commencement of operations.

The operators further explain that the actual mess was created when Etisalat sensed immediately after the bidding process was completed, that it had probably over bid for the acquired PTCL shares; and in result tried to forfeit from the bidding process after being announced as winner for the held bidding process. This move from Etisalat actually created a big havoc, and was becoming a political shame for the government due to its failure in successfully accomplishing the privatization process. It was also because the PTCL privatization was initially claimed and propagated as a big success for the previous government's privatization policy, right after the bidding process was completed. Hence, in order to protect its shaking image on this issue, the government went after Etisalat to convince it at any cost, so that to bring it back on the negotiation table. But this time, knowing the government's weakness and eagerness to finalize the deal immediately, it was done on the terms selected by Etisalat to preserve its own strategic interests in this critical investment. Hence, the critiques comment that Etisalat duly took advantage of the government's weak bargaining position under the political pressure as it was facing from the media and its public after the newly emerged scenario. In result, it was reported that Etisalat dictated its own terms and conditions on the government before finalizing the deal as part of its strategic maneuver, that included the job cuts up to the half i.e. about 30,000 employees were offered earlier 'golden handshake' (a premature pension scheme with a lump sum amount is paid) out of the total 62,000 employees. This drastic decline and down-sizing of its staff has had not only the socio-welfare consequences; but in addition to that the incumbent's operational capability of fault detection, line maintenance, and customer response time was also significantly deteriorated, as mentioned by some of the respondents. Moreover, Etisalat was partially able to address the labor unions' concerns; and thus to reduce their influence upon the telecom operations in order to make the enterprise run fully on the commercial basis. The incumbent attempted hard to remove the burden of its past legacy, which was entangled with bad practices both from the operational and executive point of view; so that this large organization could have been run professionally, just like a commercial entity.

The whole uproar in this case has been fundamentally to question the two major elements of the privatization policy namely: the fundamental rationale and the 'legitimacy' of the privatization policy in context of its resulting impacts on the national strategic interests; and secondly about the element of 'transparency' during the worth assessment and the bidding process. On part of national strategic interests, it has been argued that due to the strategic and critical importance of telecom systems and services for the national economy and security, this sector shouldn't have privatized to a foreign entity from the onset. Hence, the generally built up opinion among the masses reflected a

sense of insecurity due to the privatization of their national telecom infrastructure to a foreign entity. Secondly, on part of transparency, especially in context of the worth assessment, it has been argued that the mobile sector's expected phenomenal growth in the near future was largely ignored in the company's worth assessment; therefore the mobile operator Ufone was presumed to have been sold underpriced. It has been further argued that with just holding 26% market shares of PTCL, Etisalat shouldn't be given the total administrative and managerial control over PTCL, including the Ufone operations. However, regarding the administrative rights issue, PTCL explains that "Etisalat is not a minority shareholder even if it holds only 26% of total shares; since its one strategic share value equals to four ordinary shares, hence it's a whole different thing to be compared with the normal evaluation scheme."

In this connection, another criticism was raised on the timing of the privatization process itself. It was debated that PTCL has been proved to be a 'white elephant' and a burden on the national economy until the end of the last decade, but when it was the time to harvest the fruits of the sector liberalization and deregulation policies, this public entity was sold out to let others reap the benefits. It has been further informed that at the time of privatization the department was making a record profit for the first time with Rs.75B net revenue and Rs.30B net profit. Another criticism has been forwarded as considering that probably the privatization process of fixed incumbent was conducted too late, since by that time the government already had opened up the mobile sector by issuing multiple licenses to financially strong foreign investors; thus even before the fixed sector could have reaped the benefits of market reform initiatives in terms of the sectoral growth, the voice market had already been captured by the unmatched competitive and marketing efforts of mobile operators. On the other hand, Etisalat had to also deal with the incumbent's legacy of mismanagement, inefficiency, labor conflicts, political interferences and internal confrontations, which this previously public corporation had to inherit as part of its business culture and practices.

The general perspective of the informed users<sup>30</sup> on the PTCL privatization seems quite cynical as they assume that the incumbent's privatization has been a politically motivated decision for the personal gains. The users do not view the process as fair and in the best strategic interest of the country either. They consider that the bidding process was also controversial and nontransparent since the bidding should have been conducted openly in multiple rounds, and not through one time sealed bidding. They presume that PTCL has been sold out at an undervalued price; especially when considering Ufone and the other expensive governmental properties situated whole across the country owned by PTCL, as also referred by the Supreme Court's critical review on this subject. They argue that the privatization process has also resulted in 'social losses' not only in terms of the significant numbers of job cuts, but also due to its subsequent results in terms of the decreased capability of handling consumer complaints and maintaining the QoS. However, there was a marginal group of consumers who actually did appreciate the relative improvement in the PTCL performance after its privatization, particularly in terms of its better control over the cases of financial mismanagement, improved responsiveness in result of establishing customer's services

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<sup>30</sup> Those qualified telecom users who were found more aware of the policy relevant debates and on other specialized topics were also interviewed in order to collect their perspectives on different burning issues.



centers whole across the country, and remarkably overcoming the procedural delays in opening the new connections.

The incumbent's perspective on the adopted bidding process was very clear, saying that the due course and proper procedure was followed in this case right from sending the invitations for the 'expression of interest' till the selection of the highest bidder. It was further informed that a complete data room was established, whereas all the interested parties were provided the access to the data room (data base) and several thousand queries of the bidders were answered. Based on that homework, the statement of the qualification was prepared and the prequalified parties then participated in the bidding. Bidding was not sequential but conducted as one shot simultaneously; and the proposed bids were asked to be submitted in a sealed envelope in a box and the three participating parties submitted their bids in front of the press, public and the other representatives. After the declaration of the successful bidder, the negotiation between the government and the successful bidder was held; and after 10 months PTCL was finally handed over to the winning bidder Etisalat. The bidding was close, not open to have notified for the public on an electronic screen. It was not an 'open cry' to have given the participants the choice to raise their bids accordingly; but they had to submit the final bid at once. On the other hand, in case of an 'open cry' the contenders shout (outcry) for an adjusted amount of increments until the waiver stops and the final bidder is announced as the winner.

PTCL informs that it was the decision of the 'privatization commission' to decide what bidding mechanism to choose after the approval from the government, through consulting different competent bodies. MoIT affirms the PTCL stand on this issue by saying that "deciding the bidding mechanism comes under the expertise and responsibility of the privatization commission. Hence, the commission should be questioned and held responsible for any mismanagement issue (if any) with respect to the bidding process, and MoIT has no mandate to pass any comment in this regard." On this issue, PTA also considers that the privatization of PTCL process was itself a fair and transparent process, but it did not want to comment on the rationale of the privatization policy; whether it was right or wrong to sell out a public entity of strategic importance to foreign investors. PTA is however, convinced that the outcome of this privatization and the market liberalization process is resulted in an increasing number of licensees (cellular, CVAS, LL and LDI operators); and thus an increasing number of market players including the payphones and prepaid calling card operators. PTA further argues that the voice traffic is now distributed among a range of competing operators as compared to the pre-privatization era, where all the traffic was in control of PTCL.

However, it was generally admitted by the incumbent, ministry and the regulator that despite all the above projected facts and debates about the pros and cons of the privatization process; this is a reality in itself that the teledensity of the fixed telephony couldn't be increased, for which the privatization process was actually aimed at. In fact in the recent years; instead of seeing a steady growth, even a continuous decline in the number of landline subscribers has been observed and there is no sign of any change in this trend if some major initiatives were not taken immediately. In addition to that PTA also acknowledges that the privatization process could not bring any dramatic

change in the performance and the outcome of PTCL as a national incumbent in bridging the widening gap of the digital divide in Pakistan. The regulator comments that apart from some ‘cosmetic changes’, the rest of the business practices and the resulting impacts are more or less the same in statistical terms (e.g. teledensity) as in the pre-privatization era. PTA further argues that as a matter of fact, the privatization of PTCL unfortunately took place at a stage, when it actually started to become an extremely lucrative entity, after having suffered from severe losses for decades. However, the regulator also feels sorry for the fact that PTCL is not ready to commit any further resources in upgrading its valuable fixed line infrastructure and country-wide deployed copper networks, which will then eventually result in the further deterioration of this national asset.

## **6.6 Digital Divide & Universal Service Obligations (USO)**

The ‘digital divide’ issue has been discussed in the recent literature extensively from different dimensions. However, what is missing in these debates is a comprehensive treatment of this broad subject after profoundly understanding the social, political and economic dynamics of the local context. The term ‘digital divide’ has been generally understood by “the widening gap between those who ‘have’ access to ICT services with the relevant competencies in order to effectively make use of these services; and those who either ‘have not’ access to these services or are incapable of making any effective use of these services”. Dealing effectively with that issue would require a thorough understanding of the root causes of the widening gap between the different segments of society in terms of their ‘access’ and ‘effective usage’ of ICT services in context of their daily life activities; hence, the relative difference in their performance, growth and empowerment. However, there is no such universal formula applicable to all individual contexts in order to produce the desired results accordingly. Hence, instead of looking for a ‘one size fits all’ solution, the policy makers and other relevant stakeholders would need to profoundly investigate the intrinsic complexities and bottlenecks of each individual case within its local context both separately and then comparatively; in order to properly formulate a strategy for creating the ‘interests alignment’ among the actors participating in the diffusion process, and aiming at bridging the digital divide.

The digital divide may exist due to many reasons among the different segments of society; such as based on the geographical (urban/rural), gender (male/female), demographic (old/young), literacy rate (educated/illiterate), social (caste system i.e. classes/masses), lingual (English speaking/local language speakers), racial (discriminatory divide based on the color and race), political (elites/general public), and on the economic (rich/poor) basis. When including all these complex set of variables in the digital divide analysis to properly understand and address the core issues, then the role of leading socio-political actors and economic agents are also considered as crucial in motivating and engaging rest of the society. The author considers this broad scale engagement of all the relevant actors in a participatory mode of interaction a mandatory practice in order to eliminate the root causes of this divide; hence to help bridging the widening gap (both in terms of the relative access and usage of these services), and in result the differential capabilities of the different segments of society.

Under the UN (United Nations) mandate; ITU (International Telecommunications Union) and its relevant program WSIS (World Summit on the Information Society) aim at bridging the existing digital divide across the world through creating awareness about this issue among the masses, and accordingly engaging with their relevant governments to convince them participate and commit their resources in this initiative. They make strategic plans and recommendations for their policy institutions to help them bridging the widening gap within their own local context. In this regard, the governments and their telecom operators bear certain responsibilities and obligations to fulfill within a given timeframe. These obligations regarding the provision of access to ICT services vary with respect to the country's current stage of development and its socioeconomic conditions. However, no matter to what extent it applies, commonly these obligations are known as the 'universal service obligations' or USO (Garnham, 1997; Intven, 2000).

### **6.6.1 Bridging the Existing Gap of 'Digital Divide'**

Since there could be many reasons behind the existing scale of digital divide in any social-economic context, and that may significantly vary in terms of their relative importance and the resulting impacts; hence, for the policy level debates a proper problem formulation is required for an enhanced focus. The author suggests considering the issue at three fundamental levels of its depth namely; the service 'availability', 'affordability' and its 'usability' respectively.

#### ***Service Availability or Accessibility – The 'Universal Service' vs. 'Universal Access'***

The first level is service availability or accessibility; either in shared mode (Universal Access) or at an individual household level (Universal Service). Due to the very rapid proliferation of mobile services in Pakistan; and increasingly its image among the users as considering it the primary means of personal communications; raises the question whether the benchmark of shared mode or household level access as it has been traditionally used for assessing the scale of digital divide, should have been revised? It is because the fixed line is no longer considered a useful point of reference for mapping the teledensity in the country. Secondly, the induction of broadband services in the digital divide debate would raise additional concerns in terms of the required given weight to its access as compared to voice services, and the realized importance of the diffusion of broadband services within the policy debates.

#### ***Service Affordability***

The second level of debate starts dealing with the service 'affordability' issue. Once the service provision and accessibility is ensured, then its wide-spread use (i.e. the mass scale adoption) can't be assured until the services are made affordable and within the economic reach of a common man both at an individual and the community level. If this condition is not fulfilled and the affordability issue is not addressed properly, then committing all those extensive resources for the country-wide network deployments for the coverage and access provision would be simply considered as a waste of resources.

#### ***Service Usability***

The third level of efforts to bridge the 'widening digital gap' relates to the concept of 'usability'. Even though, the milestone of affordable service availability either at shared mode or at an individual household level is achieved; the issue of 'digital divide' cannot be said fully addressed

until the critical importance of the third factor i.e. ‘usability’ has been properly acknowledged. ‘Usability’ is about raising the general awareness and competence level among the masses for an effective and relevant usage of different telecom services; in order to make the public properly aware of the relevance of those devices and services within the context of their daily life activities.

#### **6.6.2 Creating Value at the BoP – The Grameen Bank’s Initiative in Bangladesh**

The term ‘bottom of the (financial) pyramid’ (BoP) has been frequently quoted in the recent literature to refer the poorest segments of the society with least purchasing power or living under the ‘poverty line’. Generally the term is benchmarked to refer that socio-economic class which earns less than \$2.5/day per individual. According to the World Bank’s development report indicators (2008)<sup>31</sup>, it’s shown that about half of the world’s population i.e. more than 3 billion people have been considered living in the BoP category<sup>32</sup>. In economics, this term has been increasingly used especially during the last decade since Prahalad (2004) referred to this term in his famous book ‘The Fortune at the Bottom of the Pyramid’. In his book, Prahalad discusses the potential of new business models targeted at providing goods and services to the poorest people in the world. In one of his last interviews (conducted on March 30<sup>th</sup> 2010 by Microsoft)<sup>33</sup>, Prahalad talked about one of the most important impediment in the ICT diffusion within these BoP markets, as referring to the absence of sustainable and viable business and economic models that could sustain on their own without getting any financial support either from the governmental subsidies or from NGOs’ donations. He insists the operators to commercially consider this huge market of multi-billion people living below the poverty line as their ‘micro-consumers’ whose collective worth even in terms of revenue should also be expected to exceed the current revenues they generate from the selected financially-sound markets. Moreover, he also insists on bringing further democracy to the technology diffusion efforts; hence he asks for an increased engagement of wide-scale participation from all the important stakeholders, in order to fully realize the rapid and effective diffusion of ICT services. Recently the need for such entrepreneurial and value-creating business models has been increasingly felt and highlighted in the literature that could potentially turn the serving of these previously ignored BoP markets into an appealing and profitable business; while at the same time also serving the purpose of bridging the existing digital divide among the different segments of society. In result, this could expectedly encourage the private sector to also come ahead to join the limited efforts currently committed by the actors from the public and social sectors, through engaging in some sort of collaborative arrangements; such as agreeing on a ‘public-private-partnership’ (Triple-P) model that currently works quite successfully in different parts of the world.

One of such successful case that has been frequently quoted in the different published reports, is the Grameen Bank’s<sup>34</sup> noble initiative (lead by Dr. Yunus since 1997) that aims at increasing the tele-accessibility of the rural communities through providing them mobile phones with subscription to

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<sup>31</sup> <http://data.worldbank.org/indicator> (Accessed on January 24th, 2011)

<sup>32</sup> <http://www.globalissues.org/article/26/poverty-facts-and-stats> (Accessed on Dec 22nd, 2010)

<sup>33</sup> [http://www.youtube.com/watch?v=jhkq\\_6HERe0](http://www.youtube.com/watch?v=jhkq_6HERe0) (Accessed on January 20th, 2011)

<sup>34</sup> [http://www.grameen-info.org/index.php?option=com\\_content&task=view&id=26&Itemid=175](http://www.grameen-info.org/index.php?option=com_content&task=view&id=26&Itemid=175) (Accessed on Dec 3<sup>rd</sup>, 2010)

become themselves ‘Village Phone Operators’ (VPOs). The villagers (preferably the impoverished unemployed women) were provided small loans under the micro-financing scheme based on a mutual trust even without following any cumbersome formal documented obligations. The bank has disbursed so far above \$10.12 billion (est. 2011) since its inception; and surprisingly the rate of return of the disbursed loans has been reported above 97%. The 95% stakes of the banks are owned by the borrowers (i.e. 8.34 million customers, out of which 97 per cent are poor village women), while only 5% stakes are left with the government. By doing so, Grameen Phone changed the lives of millions of the poor people in Bangladesh due to creating a unique business proposition (a ‘value’) for the rural consumers to become entrepreneur themselves with the collaborative support of Grameen Bank and Grameen Telecom, which also did provide the basic training to those villagers. Samarajiva and Zainudeen (2008) have also discussed the issue in detail in their edited book ‘ICT infrastructure in emerging Asia – Policy and roadblocks’.

### **6.6.3 Debating the Roles & Efforts of Stakeholders in Bridging the Digital Divide**

This sub-section briefly summarizes the roles and efforts committed by different stakeholders in bridging the existing digital divide in the local context, while evaluating the issue both from their own generated accounts and from the others’ perspective as well. Inspired by the above model, the author tried his level best during the field research to stimulate the different stakeholders of telecom market in order to make them agree on a framework in line with the Grameen Bank’s noble initiative; while also assessing the resulting impacts of the adoption of ICT services on the lives of poor people, in terms of observing any remarkable improvements in their health, education or economy. The author was given the impression by most of the respondents (holding key positions within their respective organizations) that such initiatives are too ambitious and socialistic in their nature, and are probably not applicable in case of Pakistan; primarily due to lacking the required amount of mutual trust and social commitment on behalf of the different stakeholders to courageously undertake such an initiative with a national spirit. A respondent commented that “neither do we have such a competence and strong commitment at an individual level, nor do we have it at an organizational level; since in our context, the vested interests are often dominated over the national spirit, which eventually leads to an opportunistic behavior and an attitude towards short-term profit seeking mentality, instead of thinking about the collective good and the common welfare of the society.”

#### ***The role of Operators and Vendors***

The operators explain that the foreign investors should not be expected to play any leading role in this context, since obviously the investors’ primary motive is to increase the return and their net profit instead of undertaking any social obligation or pursuing a social agenda. It was further told that “the foreign investors are here for making profits, and not to run a charity organization or to take care of the social welfare issues.” They argue that “if the government is interested to engage the operators in bridging the digital divide through increasing the access and service provision in the far flung areas of rural communities, then it should act as an active promoter and facilitator in raising funds and also ensuring its effective implementation for the specific agenda.” The regulator in that context comments that “at the policy level, things are quite in line with the internationally recognized ‘best practices’ but the actual problem occurs at the implementation level.” At this stage,

neither the government nor the industry on its own has the capacity to achieve the targeted goals. Hence, there is no viable option to move in this direction for successfully bridging the existing digital divide; unless the missing ‘social capital’ has been developed at the societal level with a joint effort based on a common vision, national spirit, mutual trust and a strong commitment among all the relevant stakeholders through a continuous process of consensus building and interest alignment.

In the above context, CCP views that serving both the social and economic objectives is a major challenge for the policy maker and sector regulator; however it also argues that the two policy objectives are not necessarily supposed to be creating counter-productive results for each other, as commonly assumed. The fixed incumbent PTCL also principally agrees with that opinion saying that serving the social objective leads to meet the economic objectives as well; since as we connect people with the communications world, so we generate both incoming and outgoing traffic in result of providing the telecom access. However, since serving the far flung areas and the relatively poor customers doesn’t make the business case, that’s why the private sector is not interested in extending their coverage to those underserved and yet un-served areas; hence the government has to take the lead initiative in this regard. The incumbent further explains that “PTCL is basically a commercial entity; hence it would always first seek the returns on its investments, due to being a business entity as it is supposed to do.” The above debate clearly reflects the fact that the economic objectives always supersede over the social objectives for a commercial entity, even though if it claims to have developed a well-documented list of ‘Corporate Social Responsibilities’ (CSR).

PTCL insists on finding out a possible balance for the undertaken responsibilities between the commercial entities and the government bodies in serving the desired social objectives. The incumbent proposes that “as far it is a matter of infrastructure provisioning in the far-flung uneconomical areas, the government has to be more proactive. However, once the basic infrastructure has been built, the followed up issue of service provisioning will be handled by the telecom operators and service provider on competitive terms.” The above arguments of the operators also highlight the immediate need for an effective adoption and the efficient implementation of the ‘Open Access Network’ (OAN) or the ‘Open Network Provision’ (ONP) model in order to meet the USO objectives for the access provisioning to uneconomical areas, which is also in line with the European Commission (EC) Council Directive 90/387/EEC (issued on 28 June 1990) for the implementation of ONP model for the internal market of Europe<sup>35</sup>.

MoIT criticizes the operators’ role in this regard due to adopting the ‘cherry-picking’ strategy in rolling out their networks; as they have primarily focused only to the larger cities and financial districts in order to secure their investments, while largely having ignored the far flung areas and rural communities merely on the economic basis. On the other hand, MoIT shows its high concerns about the access provision to the rural communities, far flung areas and underserved populations. However, the operators’ point of view is clear on that issue that basically being a profit making

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<sup>35</sup> <http://ec.europa.eu/archives/ISPO/infosoc/telecompolicy/en/dir97-33en.htm> (Accessed on January 26<sup>th</sup>, 2011)

private entity the operator has to first secure its investment; and one should not expect the operators to make uneconomical or irrational investments in order to serve those areas, which do not make any business case for them. Hence, they argue that committing such socially-motivated investments are essentially supposed to be primarily planned, funded and executed within a set timeframe by the joint efforts of USF, MoIT and PTA in order to connect the rural communities and underserved areas, which couldn't be done yet on the commercial basis by the competitive market forces. The operators mention that 1.5% of their gross revenues (after paying all the taxes and other expenditures) goes to USF, which is in addition to 0.5% of the gross revenue which is already being paid to R&D fund that is administered by MoIT for running different telecom research and access development programs using those funds. MoIT has been criticized by the operators for the less effective use of those funds; giving an example that under one of such program run by MoIT is to send students from all walks of life to abroad for the training purposes (in which even the agriculture students have also been sent due to political interventions). The operators question that how come one can expect from the competencies of these so-called trainees that they will come back and serve the telecom sector, when they would have probably no capacity to do it? Thus, MoIT has been blamed for the less effective use of the available funds due to its inability to handle the unjustified external interventions.

The cellular operators argue that the digital divide is observed to be reducing day by day and not widening in Pakistan in result of the provision of an extensive cellular coverage across the country. However, since their claim is primarily based on the statistics received from the cellular market; hence its validity also prevails only within the mobile sector. But even here, when it comes to the relative usage of 'mobile broadband' services; the scenario is quite different since one can easily find the widening gap, both in terms of the service affordability and its effective usage. On the other hand, in case of the fixed line and broadband internet services, the statistics clearly reflect that there is a widening digital gap in terms of access provision, service affordability, QoS crunch, and service usability. CCP also agrees on that perspective, saying that during the past decade the digital divide issue has been more intensively discussed not only from the accessibility point of view; but also from the affordability and usability perspectives. Furthermore, it has been debated that the available ICT access statistics should also be analyzed based on the individual contribution of the different telecom services in the overall declared teledensity (which is currently around 63%). This is considered important since the cellular teledensity represents an overwhelmingly large pie of the overall teledensity (i.e. 94% of total teledensity); whereas the collective share of the fixed line and broadband services is remains around 6% of total teledensity. Hence, literally it's primarily the growth of cellular services that defines the increased status of teledensity in Pakistan.

From the affordability perspective; the possibility of successfully launching a micro-financing scheme has been discussed with a large computer vendors, in order to make available the PCs and laptops at easy installments to the university students and government employees. It has been however argued by the vendor, based on its past experience while working on such a scheme itself, that "such a proposition is practically and economically an unviable solution; mainly because the low cost locally assembled products at cheaper retail price for the targeted groups of users would



eventually be start selling in wrong markets through ‘grey channels’ for which the products were actually not intended for.” In addition to that, it was told that the university’s guarantee for repayment of small loans for the purchase of laptops is not trust worthy due to having bad experiences in the past. Furthermore it was informed that the prices couldn’t be kept more competitive than what is already available at the retailer’s shop; since the retailer can give it cheaper by avoiding the 16% GST (General Sales Tax) on the product, if the product is sold without providing the formal receipt to the customer (as it is considered a business norm in Pakistan). However, paying GST cannot be avoided when the bank transactions are involved; however, presumably it could only be beneficial if the government withdraws the GST on such targeted micro-financing schemes for an increased affordability among the low-income targeted segments of society. On top of it, there is a bank interest rate (or the ‘service charges’ in case of interest-free loans), which is around 14% on small loans; hence this makes the product already 30% more expensive than its original price (if GST was also paid). The only advantage in this case would be the repayment of loan in small installments, but this was not considered a sufficient incentive in order to formally acknowledge the viability of this proposal.

On the other hand, the vendor also shares its experience of engaging with the banks and different utility companies in the past; where the vendor tried using the utility companies (such as the electricity, water and gas companies) as a guaranteed channel for the return of loan payments. In that case, the banks were supposed to issue a small loan to the interested customers in order to let them buy a mobile phone, laptop or a desktop for themselves; whereas the amount of loan would have to be repaid to the respective banks by the customers in easy installments through the monthly utility bills (as making it part of the collective bill). These utility companies were thought to be relatively more reliable entities in order to become a guarantor in the loan repayment process, but that experience was also failed due to the lower interest shown by different stakeholders in result of the existing trust deficit among them. It has been mentioned that the vendor did try its level best to bring the relevant stakeholders on the table in order to discuss the viability of this proposal. In addition to that the proposal was also sent to the government officials; so that this scheme is seen as a complementing initiative in their efforts to bridge the digital divide, but no response or willingness was expressed on their behalf to show their desire in participating in any such initiative.

Finally, from the usability perspective, the critical need for developing useful and relevant contents and applications has been unanimously highlighted by most of the respondents, in connection to bridging the digital divide. It has been insisted that the issue could have been effectively addressed if the relevant applications with useful contents were made available to the end-users at an affordable price; in addition to giving them proper awareness and some prior training about the effective usage of different ICT services and the delivered applications. However, in this context the desired role of the content and application developers has been called largely absent in Pakistan, which is required to be fulfilled on an urgency basis. Given an example here, that an uneducated farmer working in his farm or a fisherman sitting in his boat in the far-flung coastal area should not be expected spending money on using ICT services, if they were not made aware of how and for what purposes these services could have been used within their own local context. The question was



raised, whether could we expect in the current status of the deployment of internet services in the country that internet might facilitate a common man like a farmer or a fisherman as efficiently and effectively as the use of mobile phone actually facilitates them in their specific context of usage at quite an affordable rate?

### *The Role of the USF Company*

The 'Universal Service Fund (USF) Company was established in 2006 by government (under the auspices of MoIT) in order to spread the benefits of the ICT revolution to all the corners of society. USF aims at promoting the development of telecom services in un-served and under-served areas across the country. The Company explains<sup>36</sup> that the fund (USF) is primarily composed of the contributions made by the telecom operators (i.e. 1.5% of their adjusted revenues); but with no government funding involved whatsoever. In addition to that the Company also receives a handsome amount in terms of MTR (Mobile Termination Rates) from the incoming international calls, which could also be considered as the APC (Access Promotion Contribution) share assigned for USF in case of the termination of international calls at the cellular networks.

For the readers' convenience, the mechanism used for the split of APC in Pakistan has been briefly explained here. The currently 'Approved Settlement Rate' (ASR) for all incoming international calls has been set 10.5 cents/minutes; out of which 5 cents are paid to LDI (Long Distance International) operator for carrying the call as long-distance carrier, where as the rest 5.5 cents/minute is paid to the LL (Local Loop) operators in case if the call is terminated at a fixed line. The LL operator is assumed to use that amount for the network expansion, building infrastructure and other activities related to the 'access promotion'; hence this part of ASR is named as 'Access Promotion Contribution' (APC) paid by others to the fixed line local loop operator. This considerably large amount of APC is paid to the fixed line operators in order to be spent on its efforts for the 'access promotion and network expansion' whole across the country; even in those far-flung and sparsely populated areas as well, where conducting such activities under the normal business terms and conditions are considered uneconomical and unfeasible for a fixed line operator.

On the other hand if the incoming international call has to be terminated at a cellular network, then the mobile operators are not entitled to receive 5.5 cent/minute, as opposed to the case of LL operator; since their cost of access provision has been estimated relatively much lower than of the fixed line operators. Hence, in that case the APC goes to USF, in order to be spent for the promotion of ICT infrastructure and services across the country for the benefit of society. In this whole scenario, it is obvious that APC is highly in favor of the fixed incumbent, since being an LDI and LL operator at the same time (with more than 90% market share of fixed line) means that the fixed incumbent keeps almost all the ASR (10.5 cent/minute) that it receives from the foreign operator; whereas in case of the call termination to a mobile operator, it still receives 5 cent/minute (as LDI operator if call was carried by the incumbent) in addition to its share from the USF fund on account of the sponsored projects related to the fixed line access promotion. However, the fixed

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<sup>36</sup> <http://www.usf.org.pk/Company.aspx> (Accessed on January 13<sup>th</sup>, 2011)

incumbent (PTCL) informs that today 80% of international traffic is going to mobile and only 20% remains to fixed line, which means that the share of USF increases proportionally as the share of mobile voice traffic increases in the international incoming calls, which must be upsetting the fixed incumbent in terms of revenue.

The main objectives of the Universal Service Fund (USF) are:

- To bring the focus of telecom operators towards rural population and increase the level of telecom penetration significantly in the rural areas through an effective and fair utilization of the fund
- To improve the broadband penetration in the country
- To bring significant advances towards enhancement of e-services, both in rural as well as urban areas of the country

The major programs and projects so far initiated by the USF Company are:

- 10 contracts (fund allocations) signed for 6,118 un-served 'Mauzas' (i.e. largely populated villages) in 39 Districts to be provide with the basic telecom services
- 12 contracts signed for 434,750 broadband connections to be provided in 44 un-served districts
- 5 contracts signed for 5,324 km of optical fiber cables to be laid covering 80 un-served 'Tehsil' (i.e. large administrative units consists of several villages and towns) headquarters
- Conversion of 11 existing rural computer centers into telecenters pilot projects

The USF Company finances (in form of 'subsidies') to different initiatives targeted at spreading the telecom services to previously un-served or under-served areas; and thus making it possible for the licensed telecom operators to commercially provide services to those disadvantaged areas (also called as 'Lots'). The major challenge before the USF Company is to achieve the targets through an efficient and transparent bidding process under the competitive terms. Therefore, all the disbursements of the funds are done through a competitive ('reverse') bidding, while encouraging a full-scale competition among the telecom licensees, as explained by the Company. The Company claims that its account has been audited twice a year by a group of professional external auditors; and so far it has never got any audit objection during the last six audits; hence the element of transparency has been ensured. In the presence of the current economic recession and relatively a very weak financial status of the banking sector in Pakistan; the banks cannot be expected to play any major role with respect to financing any such large initiative aimed at meeting the social objectives and bridging the digital divide. Thus, it is assumed to be primarily the role of the USF Company to sponsor those projects deemed to be supportive in meeting the USO objectives.

The Company mentions that for the effective management and efficient utilization of the fund, the Company has been run like a 'corporate' under an independent board of directors. Out of the eight board members (or directors), half of them are from the government and the rest half from the private sector. The board directors from the government side include; the Minister of MoIT (in its absence, the PM represents the ministry), Chairman PTA, Secretary of IT & Telecom (cabinet

divisions), and Member Telecom (MoIT). Whereas, from the private sector, the four directors include; Single representative from each of the Fixed line, Mobile and IT (broadband) sectors, and one representative of the 'Consumer Group' Association. It has been told that the representatives do not have any stakes in the Company; hence it is called to be functioning as fully an independent, transparent and neutral body. It has been mentioned that the selection of the representatives among the operators has been done so far through a mutual consensus, and there has not been any issue with respect to the selection process up until now.

Whether the Company has been successful in bridging the digital divide to any substantial or even noticeable degree; the received answers from the interviewees were found quite mixed in terms of their assessment of the Company's performance so far. The cellular operators were relatively more dissatisfied as compared to the fixed incumbent and the broadband operators. The cellular operators view the role of USF Company quite marginal; hence accordingly the relative impacts of its initiatives on the society has been viewed quite negligible, especially in context of the diffusion of fixed line and broadband services. The cellular operators consider that the Company's management is portraying itself too much like a corporate body with an extensive bureaucratic taste in its adopted 'modus operandi'. It has been further explained that the financial handling practices of the Company (for the funds allocation or the 'lots' allotment) is not rationally justified as per the cellular operators' perspective. The cellular operators also accused the Company's administration for consuming too many resources in maintaining its corporate style of management, and in hiring the outdoor consultancy services. It has been further added that the Company has been observed being more frequently used for the political purposes than proactively playing its role in resolving the issues related to the digital divide in the country.

However, the fixed incumbent has been quite positive about the role of USF Company; saying that the Company has been acknowledged among the most successful USF program runners in Asia today (though the reference for this claim has been not provided by the respondent). The broadband operators were also found relatively more satisfied (as compared to the cellular operators) with the Company's overall performance and its achievements so far with respect to the efficient utilization of the funds for the targeted objectives. The broadband operators even further demand for an increased percentage of ASR to be allocated for USF, which means that they demand for a reduced ratio of APC in the 'revenue split' formula. However; for the obvious reasons, the fixed incumbent is expected to fiercely oppose this idea. Here, clearly we can see a rising 'conflict of interests' between the broadband and the fixed line operators; even though their interests are aligned in appreciating the role of USF, since both are relatively more benefited from those allocated funds. Looking from this aspect, it is probably the current pattern of the fund allocation that makes the fixed incumbent and broadband operators relatively more satisfied with the performance of the USF Company; since in the existing formula, they manage to get an overwhelming share of the USF for the access promotion through the assigned 'contracts'. On the contrary, the cellular operators get quite a minor share from the allocated funds; despite the fact that they contribute quite a significant part of the total accrued fund (i.e. around 80-90% of the total fund, as claimed by the cellular operators). The cellular operators get the minor share in the assigned contracts, due to the fact that

there is already present an extensive coverage and access availability of the cellular networks whole across the country; in result of their committed huge investments in their networks' roll out under the competitive pressure. The above mentioned situation creates a feeling of being unfairly treated, among the cellular operators due to seemingly an unjust fund allocation mechanism; hence the situation demands that the policy making institution should take the matter into consideration.

The cellular operators have some further grievances to share with MoIT. They say that despite the fact that they contribute the overwhelmingly large part of the fund, and the cellular networks also make the largest part of the country's total telecom access provision (i.e. above 94% of the total teledensity); but still they feel like their proper mandate has not been acknowledged in the Company's decision making process, due to the fact that they only have one representative among the 8 members' board of directors. Furthermore, often the cellular operators are even not considered eligible for participating in the 'reverse bidding' process to get any financial assistance or subsidy for their operations, especially in case of improving the provided QoS through an extended cellular coverage. On this point, the broadband operators also support the stand of the cellular operators, adding that the USF subsidies should have also been offered for upgrading the QoS and coverage of the broadband services even within the urban areas as well; since internet is not just about the access provision, but it is more relevant to also talk about the users' experience with the provided QoS (thus the issue of the 'bandwidth crunch' comes here). In addition to that, the cellular operators complain that even if some lots were issued for the provision of cellular coverage to the last remaining 10% of the far flung areas of the country; then the provided subsidy is deemed too low to make a business case for the operators, considering the total expected costs of the network deployment, the forthcoming OPEX (operating expenditure) including the O&M (Operations and Maintenance) costs. It is further told that despite having this uneconomical scenario; if the cellular operators commit themselves, then the vendors are not ready to build the infrastructure, especially in the risky areas due to the bad law & order situation over there. This overall scenario has been called quite upsetting for the cellular operators; hence their fair grievances need to be properly addressed.

#### ***The 'Rabta Ghar' Initiative by PTA***

Inspired by the Grameen Bank's successful initiative in case of Bangladesh, PTA also took an initiative back in 2007 to equip the selected rural areas with modern ICT facilities by establishing 'telecenters' over there. However, the selection mechanism and the basis of merit for deciding how many telecenters would have to be installed in each province were not clearly specified; hence the transparency element was apparently missing in that initiative. This procedural hole in the selection and decision making process didn't help curtailing the chances of unjustified political interventions in the decision making and resource deployment process. The telecenters known as 'Rabta Ghar' are called to be equipped with the modern communication facilities such as computer, fax, printer, scanner, mobile, fixed telephone and the internet services. The project was sponsored by PTA, PTCL, Mobilink, Instaphone, Ufone, World Call and Intel. It was however surprising to note that there were no ISPs or the broadband operator involved in this project, which probably needs further explanation from the regulator. The project was aimed to bring rural areas closer to the relatively

developed areas and urban towns in terms of telecom facilities; and furthermore to provide self-employment opportunities to the rural communities, particularly the unemployed youth segment of the society. They were provided free telecom equipments to establish the telecenters, in addition to delivering the basic training facility; so that they could independently run the franchised ICT facilities within their localities. The target was set to establish 500 of such telecenters as part of a 'pilot project', out of which around 400 telecenters are reportedly established so far (est. 2010).

Different stakeholders were asked during the interviews to evaluate the relative impact of this initiative with respect to bridging the existing digital divide in Pakistan, especially when compared with the Grameen Bank's initiative in Bangladesh. The fixed line incumbent (PTCL) explains that "PTA planned to establish 500 of such telecenters in order to increase the teledensity in the rural areas, but eventually it ended up with just 400 telecenters. Establishing such community centers to provide access to ICT facilities in shared mode was deemed a feasible choice particularly in the far flung rural areas where it was not economical to lay down cables to each individual household. However, the cost of this initiative was contributed by both PTA and the participating operators." PTCL further explains that "the additional ADC (Access Deficit Charges) was not paid in this case for the expansion of coverage to those underserved areas, and the lines were provided in response to PTA's request under the normal billing conditions." In response to the question, why PTCL did not take such an initiative earlier on its own due to being a national fixed line and internet incumbent; it has been explained that "PTCL did proliferate public pay phones in collaboration with other partner firms (which are now turned out to be our competitors), but if PTCL would have done all this on itself then definitely it would have consumed a lot of HR and management resources, which was not an optimal choice for the company from the commercial perspective."

The cellular operators comment that the need is to spot out some ideal location such as a public libraries or schools in order to first build the basic infrastructure for the proposed telecenters over there. It includes the provision of the essential living facilities such as the road access, drinking water, electricity and gas, sanitation and sewerage system, furniture and the basic telecom devices and other network facilities; in order to conveniently provide ICT services for public usage in a shared mode access. It has been argued that due to the affordability issue and the lack of education, particularly among the impoverished and vastly uneducated population living primarily in the rural areas; the shared mode public access to basic ICT facilities in a reachable distance of the targeted communities is considered to be a viable option for bridging the digital divide from the 'Universal Access' (UA) perspective, especially in context of the poor developing economies. On the other hand, aiming for the 'Universal Service' model in order to deliver ICT access to each individual household would demand enormous resources, strong commitment and untiring collaborative efforts on part of the policy makers, regulators, telecom suppliers and other stakeholders.

Combating with the digital divide issue, MoIT principally agrees with the fact that it demands a joint collaborative effort by all the relevant stakeholders. The ministry also acknowledges the need for a leading role to be played by MoIT and PTA in this context, in order to bring the different interest groups on board by aligning and converging their vested interests to a common focal point.

Creating such a common vision is the prime art of the policy maker and regulator to understand how to provide stimulus to spur the interests of various actors in the large scale collaborative initiative. Creating this common vision should also include the facilitation and encouragement of telecom suppliers in developing viable, economical and self-sustainable business models; and thus setting the stage for a ‘win-win’ solution for all the relevant stakeholders including the users. For an increased engagement and active involvement of the users in the rapid diffusion and effective adoption of ICT services, it would require not just promoting their access to those services, but also creating demand for the useful and relevant contents and applications. For example, if the common interests of the rural communities circulate around their own issues relevant to agriculture (farming), milking, livestock, fishing and poultry relevant stuff; then the informative contents with the relevant applications should have also been made available within the local context in order to facilitate them getting the desired useful information, preferably in their local languages. For example, such content may include the textual, audio and video documentaries to provide the informative guidelines to help rural communities in learning the best agriculture and veterinary practices, the recommended seeds and fertilizers and their market prices, or the best seasonal periods with the specified locations for an optimal fishing along the costal line.

MoIT mentioned about a USF led initiative in this context called the ‘multipurpose community centers’, where the access to ICT services are provided in a shared mode to especially facilitate people with reference to acquiring information on their relevant issues and subjects of interest. MoIT considers that the ‘Rabta Ghar’ initiative was seemingly an attempt from the regulator to replicate the Grameen Bank’s experience; but merely from the ‘access provision’ perspective and not from the ‘content provision’ perspective. MoIT argues that without creating awareness about the proper usage of modern devices through developing useful contents and the relevant applications, merely celebrating on the ‘access provision’ to those rural communities would be considered just a partial success. MoIT further comments that “definitely by no means the PTA’s Rabta- Ghar initiative could have been compared with the Grameen Bank’s initiative in terms of combating with the digital divide issue, both from the perspectives of an increased teledensity (access provision) and the resulting impacts (for the social and economic empowerment of rural communities).” Hence, in this context the ‘Rabta-Ghar’ initiative was essentially considered not more than a ‘symbolic’ move towards tackling this highly complicated and challenging digital divide issue, especially when compared with the offered ‘scale of treatment’.

The ‘problem solving approach’ commonly used by the Pakistani authorities, particularly in the public sector fundamentally reflects a general tendency of approaching towards an issue quite narrowly within an immediate timeframe; with little temptation to look at the issue in a broader horizon from a longer-term perspective in order to find out a sustainable and durable solution. Hence, the conceptual association and the logical relation between the different stages of a taken initiative or project activities are often quite unclear. For example, it is often quite blurry to trace out the logical connections between the initially set policy vision, the performed strategic planning, the adopted or implemented action plans, and thus the resulting impacts of the whole initiative. In addition to that, the different initiated projects and programs are often left open-ended without

reaching to any logical conclusions to help leading other towards the next proposed phases of development; and eventually, it results in the ruthless waste of scarce resources.

In the current context also, the regulatory and the policy initiatives taken so far (e.g. the above discussed different projects as commenced by MoIT and PTA separately) in order to combat the digital divide issue in Pakistan seem to be not quite clearly linked and associated with each other coherently; so that the descendants could be helped with providing some explicitly documented ‘experiences’ and ‘learned lessons’ of the previous initiatives. It has been observed that the previous projects do not provide any clue about those valuable learned lessons to help others (or the followers) in taking corrective measures accordingly; hence to effectively evaluate the resulting impacts of the previous initiatives as well. Thus, the author suggests here to the relevant authorities to improve and fine tune their coordination during the policy making, setting a common vision, its efficient and effective implementation, and the conscious use of scarce resources in order to achieve the targeted objectives and to deliver the desired results.

### ***Provision of Affordable Laptops in Easy Installments – A Case Study***

The campus-wide wireless internet connectivity becomes meaningless if the academic users, particularly the students won’t have the purchasing power to own a laptop in order to carry it along with them while roaming around the campus area. Apart from resolving the concerns regarding the poor wireless connectivity and the productive use of internet by students; the affordability issue has been considered as the major bottleneck in this regard, especially in the public-sector universities. In order to address this issue, the author conducted a small case study to understand the real bottleneck in the facilitation process to help provisioning of laptops on easy installments to university students through constructively engaging the three major stakeholders i.e. the bank (as loan provider), computer vendor (as dealer or supplier), the university administration (as guarantor). For this purpose, the author made a proposal (see Appendix 2) and sent it to all three actors in order to check their responses and to also know their respective concerns. The computer vendors and dealers were found extremely excited about this proposal since their products were being sold out, but they wanted advanced payment from the banks before committing to this proposal. On the other hand, the banks were entirely uninterested in any such proposal, since they considered a higher investment risk involved in this proposal. Finally the response from the university administration (esp. from the public sector universities) has been also ‘not’ very welcoming due to the long bureaucratic procedures involved in the sanction of such proposals, and also based on their past experiences, which were not very encouraging due to an extreme lack of mutual trust among the stakeholders in the transaction process. However, such projects have been seen relatively more successful in case of the private universities, since in that case the university administration often facilitates the process by including the cost for the delivered laptops already in their tuition fee. Hence, here the government has been asked to play its critical role as project sponsor and guarantor in order to help building the missing trust element (social capital) among the engaged parties.

## **6.7 FDI – Analyzing the Balance between Foreign and Local Investments**

The incoming foreign direct investment (FDI) has been traditionally considered a positive sign for the promising growth and development of an economic or technological sector; and in addition to

that, the flow of FDI also indicates the relative level of confidence of the foreign investors on a particular economy. However, some circles also argue in favor of balancing the scale of foreign investments in a country with the relatively increased participation of the local investors; in order to avoid an overwhelmingly high dependence on the foreign investments, and thus to ensure an independent and self-sustainable economic growth, even if all the FDI were withdrawn at a stage within a short notice for any economic or political reason. The critiques also argue that a disproportionally high FDI in the strategic sectors of an economy may also jeopardize the sovereignty of a country at the time of conflict with the larger economies from where the major investments belong to. Hence, following the above line of argument, it has been recommended to strike a fine balance in the adopted industrial and economic policy in terms of deciding; whether to unconsciously open up the local markets for the foreign investors due to a strong desire for a huge incoming FDI in order to realize an immediate sectoral growth; or to make a gradual opening of the local markets while also dedicatedly encouraging and facilitating the participation from the local investors in order to increase their relative share and control particularly over the strategic sectors, like the telecommunication sector.

Some respondents also critically analyzed the reasons for the recently observed huge incoming FDI within the telecommunications sector, particularly from the Arab world. They argue that after the 9/11 incident; the Arab investors felt their investments relatively unsecure as they were deposited mostly in the US banks; so they wanted to bring it back under their direct supervision. At that time, the security conditions were much better in Pakistan with relatively more political and economic stability; in addition to the declared positive indications and economic speculations about the promising financial growth in future, as the increasing financial reservoirs and the stock market index were reflecting. In the mean time the telecom markets in Pakistan were also just about to open up, as the sector deregulation and liberalization processes were under way. In result of those positive indications and in-progress reform initiatives; the fixed incumbent PTCL was offered for its privatization, whereas three new cellular licenses were also announced to be issued. In addition to that multiple LDI, LL, WLL licenses were also planned to be issued in a short time. All these developments created a positive and welcoming landscape for the foreign investors to consider the worth of the emerging telecom market of Pakistan, as a lucrative and highly promising market.

Pakistan was also considered as an interesting market particularly for the Arab investors because of its geographical and cultural proximity with the Arab countries, and also as a matter of fact that it has been historically under a great political influence of those oil-rich Arab countries. However, some of those favorable conditions (e.g. the sectoral reform processes and in result the opening up of telecom market, and the use of external political pressure over the Pakistani decision-making authorities for gaining privileged business incentives) did also attract the Chinese and European investors to invest in this market. In line of the above explained assumptions, investing in Pakistan was probably considered as relatively safer that time by those foreign investors. It was further told that, at that time the government was also starving for the foreign investment; hence it also created a favorable condition for an increased incoming FDI. In result, there was recorded an unprecedented amount of FDI in all the economic sectors including the banking and construction sectors, but most



significantly within the telecom sector (since the year 2003-04); hence accruing a total FDI amount to above \$20B, of which about one-third was invested in the telecom sector for the infrastructure development and provision of telecom services. The mobile sector; however has reportedly attracted the largest part of the incoming FDI within the telecom sector. At one stage (during the fiscal year 2005-06) the contribution of telecom sector reached to even more than half of the total incoming FDI, as mentioned in table 6.

<b>Foreign Direct Investment in Telecom Sector (US \$ million)</b>			
	<b>FDI in Telecom</b>	<b>Total FDI</b>	<b>Telecom (%) Share</b>
<b>2003-04</b>	207.1	949.4	21.8
<b>2004-05</b>	494.4	1,524.00	32.4
<b>2005-06</b>	1,905.10	3,521.00	54.1
<b>2006-07</b>	1,824.20	5,140.00	35.5
<b>2007-08</b>	1,438.60	5,410.00	26.6
<b>2008-09</b>	815.00	3,720.00	21.9
<b>2009-10</b>	374	2,199.00	17

Table 6: Foreign Direct Investment in Telecom Sector

Source: [www.pta.gov.pk](http://www.pta.gov.pk)

The above table also depicts a gradual but sharp decline of FDI collectively in the whole economy, particularly during the past couple of years, but seemingly the current drop down of the foreign investments has more severely hit the telecom sector. The fiscal year 2009-10 has experienced a record low level of FDI within the telecom sector; and it reflects a more than five times drop in the FDI, when compared with the golden fiscal year of 2005-06, thus leaving the telecom share only up to 17% in the total FDI. Hence, the author suggests the government and policy makers to profoundly analyze the situation and thoroughly evaluate the reasons for the recent drastic decline in FDI, while particularly focusing on the telecom sector; in order to take the necessary measures on urgent basis to address the key concerns of the foreign investors to restore their level of confidence on the economic stability and the general prospects for its future growth.

As discussed above, some corners of the society were found deeply concerned about the negative implications of the disproportionately high amount of incoming FDI in comparison to the observed participation from the local investors, ever since the market reforms were introduced and the telecom market was opened up for the foreign investors. They consider it potentially a strategic threat in the future context due to the strategic significance of the telecommunications in the national economy, and for its security and integrity. Hence, they principally oppose any move that may lead towards losing the strategic control over the telecommunications facilities. The author discussed the above line of argument with different operators, regulator and the ministry in order to collect their perspectives on the issue as well.

### ***The Counter Argument in Favor of the Productive Role of FDI for the National Economy***

The operators' general standpoint on that issue was clear that they fully appreciate any proportion of incoming FDI within the telecom sector; since it helps stimulating the business activities and also

helps encouraging the local investors to more confidently invest in this sector. The operators generally do not consider the disproportionally high scale of FDI in comparison to the current scale of local investment as any worrying signal, since FDI helps in expanding the rapid roll out of infrastructure, which otherwise won't expand that fast. Furthermore it also creates business and employment opportunities both for the local companies and the general public. Hence, they argue that the network rollout, infrastructure building, service development, employment opportunities and the general market growth should not be discouraged; no matter if they occurred to be in result of an increased FDI or by the local investments, since it is the Pakistani consumer who ultimately gets benefit out of it by being connected to the information and communications world. However, they also acknowledge that it would have been better, if we could have done that ourselves (e.g. like in case of China, South Korea, Malaysia, India etc.) through developing our own indigenous competencies, and by encouraging the local investments with the help of building 'investment consortiums' under the government's policy and institutional facilitation.

Following the above line of argument, the operators also suggest the government and its policy-making institutions to adopt a consistent and well-thought policy framework; in order to ensure the protection of national interest and strategic assets of the country through following a proper check and balance mechanism. However, in this context apart from the government, the local investors were also accused of behaving opportunistically and being short-sighted in the national context. Hence, the operators suggest the local investors to have more courage, broader vision and a longer term commitment with a 'national cause'; hence to consider investing in Pakistan in order to grow the local industry and develop an indigenous pool of talents and the required competencies. The telecom operators discourage the trend among the local capitalists and investors for keeping their huge capital in the foreign banks and only investing in their businesses abroad; instead of investing and growing their businesses within their own country, which desperately requires investments from their own people and deserves their strong commitment with the country in this challenging time of the political and economic turmoil.

In the above context, an issue was discussed that Pakistan has essentially become a 'consumer society' (services' market); instead of becoming a 'producer society'. The respondents attributed the above argument to the fact that Pakistan primarily lacks the required scale of participation from its local investors within the developmental projects; which is partly due to the absence of government's any clear vision about the future, and lacking its proactive role in facilitating the local investors through providing the essentially required institutional support for the protection and growth of their investments. The local investor doesn't want to take any risk or jeopardize its investment due to the prevailing uncertain market conditions. This situation leads to a common impression that the country has been strategically handicapped to foreign banks and investors due to being overwhelmingly dependent upon the foreign loans (which are received under strict and often at insulting terms and conditions) to run its economy and commit to developmental projects (if any).

However, MoIT and PTA had a common stance on this issue as they commit themselves to further promote the incoming foreign investments in the telecom sector, while at the same time also

facilitating the local investors to actively participate. MoIT promises that the above discussed concerns will be addressed in the forthcoming documented policies, by supporting the local investors with the provision of additional flexibility and incentives in order to boost their confidence. MoIT told that it was also the original intent of the adopted 'deregulation policy' to encourage the local investors come into the telecom business; so that the 'integrated license model' could be gradually moved towards a 'separate licensing regime' for each different class of services, and in addition to that the licenses to be assigned on the regional basis at substantially lower fee as compared to the nation-wide cellular licenses. In result, a large number of LDI, LL, WLL and CVAS licenses were issued to let the local investors promote the telecom sector with more favorable business conditions and less entry barrier in terms of licensing fee. However, the telecom operators insist that the government also needs to provide the necessarily required institutional support to the investors by reducing the unnecessary bureaucratic hurdles, and effectively checking on the corrupt practices that force the investors to quit their businesses due to the unbridgeable scale of difficulties that they face while doing business or investing in Pakistan. However, PTA assumes that the current imbalance between the FDI and local investment cannot be expected to dramatically change, until the country becomes economically and technologically self-sufficient.

#### ***The Role of a Visionary, Competent & Committed Leadership for Indigenous Development***

Despite the fact that every nation wants to become an independent and self-sufficient in their production activities, as a matter of fact, in most of the cases the producing nations have been comparatively lesser than the consumer societies. In return of the author's curiosity for knowing the most important reasons why Pakistan couldn't turn itself into a producing nation, particularly in the telecom sector; the operators respond that "we cannot necessarily follow the same developmental trajectories as followed by other nations such as Finland, China and S. Korea as they have now reached to a leading position in the telecom business; primarily because we have very different socio-economic conditions and realities as compared to these nations." They further argue that the development of indigenous competencies with the help of technology transfer and through building in-house production facilities essentially require a visionary and committed leadership with a strong political 'will' and an effective strategic planning, which has been essentially lacking in the country's current and previous political leaderships, especially when compared with the other technologically developed and emerging nations of the world; as seeing how their economies and local industries have grown up during the past couple of decades. Giving an example, it was disclosed that historically Pakistan has been producing telecom equipments in its two well-known local production facilities namely Carrier Telephone Industry (CTI) and Telephone Industry Pakistan (TIP) in the 'Hurripur' region since 1960s with the investment and cooperation of Siemens. But later on, due to lacking the required institutional support and financial backup from the government, these companies couldn't survive their competitive positions in an increasingly competitive telecom manufacturing markets; and hence they were either closed down or sold out to foreign entities.

## 6.8 VoIP vs. Grey Trafficking - Future of IP Telephony & its Legal Status

'Grey trafficking' has been named to an illegal operation of routing international calls using unauthorized gateways and routers operating at individual premises, often by some outside companies not known as direct stakeholders in the local telecom market. To curtail this illegal activity, PTA monitors and reports to the operators about those suspected phone numbers which may have involvement in grey trafficking; then the operators are held responsible to block those numbers after due verification. The telecom operators especially the fixed incumbent as well as the national economy suffer substantial losses due to this illegal practice. On the other hand, if the routing of voice traffic through data networks (internet) is given the regulatory provision, while permitting all the operators to adopt such call routing potentially as their core business model, in that case this call routing practice would be known as 'Internet Telephony' (IP telephony) or Voice over IP (VoIP). In those countries where VoIP has been given the legal status under the protection of an effective 'technology-neutral' regulatory regime, it has been generally observed that the grey trafficking (or bypassing the legal channels) often does not find a solid or competitive business ground for conducting such a practice; primarily because of the fact that there the telecom operators have themselves effectively adopted this cost-effective technology as an integral part of their business model and their core communications system. Whereas, those last remaining countries like Pakistan, who have traditionally resisted the effective adoption of this cost-effective innovative technology as an integral part of their communication system; primarily to protect the vested interests of their incumbents and powerful market players were observed having severely suffered from an overwhelmingly high trend of such illegal call routing and grey trafficking practices.

It has been unanimously agreed among all the respondents that the future of telecom markets is a gradual shift and transition towards Next generation networks (NGN), which refers to key architectural evolutions within the telecommunication core and access networks. The general idea behind NGN is that the single IP-based network transports all the information (including voice, data, and video) by encapsulating the digital bits into packets. In NGN the service-related functions are independent from the underlying transport-related technologies. It offers an unrestricted access by different users to different service providers, which means that whenever a provider wants to enable a new service, they can do so by simply defining it directly at the service layer without considering the transport layer i.e. the services are in fact independent of the transport details. Mehmood (2005) refer in their paper about the conducted experiments few years back at the different communication nodes in Pakistan in order to monitor the different types of traffic arriving at those tested nodes and their connecting links. Those experiments disclosed that approximately around 50% of the internet traffic was composed of VoIP (Voice over IP) packets. It is important here to bear in mind that the given data is based on experiments conducted in the year 2005, thus the current situation would likely to refer even a higher ratio of VoIP traffic in the total telecom traffic. This trend clearly indicates that VoIP traffic is growing in volume and thus becoming a significant component on the PIE (Pakistan Internet Exchange) backbone. Apart from the IP-telephony, the statistics for IP-TV (internet broadcasting) traffic has been also observed growing fast. Both LDI and cellular operators consider the IP-telephony as relatively more cost-effective and efficient communication means when compared with PSTN (Public Switched Telephone Network).

The VoIP and IP-TV (as often named as ‘Triple play’ when internet is also included in the same package) are one of the resulting applications of IP-based next generation networks.

The telecom vendors are observed increasingly interested in this ongoing transition from the traditional PSTN based telephony (circuit switching) towards an IP-based telephony (packet-switching); and they seem like fully committed to secure their business shares in this emerging market, which would ultimately replace the traditional telecommunications systems (circuit-switching). The vendors mention that Pakistan is one of the last remaining countries where VoIP hasn’t got yet the full legal status due to the provided regulatory protection to the fixed and cellular operators’ financial interests in result of a strong lobbying pressure from both the fixed and cellular operators; as they are apparently unified in opposing VoIP operators entering into the mainstream voice communication market. It appears that the opposing operators are threatened by the scale of services and applications available in the VoIP technology, which are available at comparatively much cheaper rates e.g. considering the case of international calls and video conferencing facilities. It has been further told that despite the current regulatory barrier, VoIP has been increasingly used by many large enterprises as their core solution to support their communications facilities, particularly for making international calls and establishing ‘intra-net’ communication systems among their different offices located across the world.

### ***The Policy and Regulatory Barriers on VoIP***

Bhatti (2007) argues that from the regulatory point of view, the emergence of these next generation networks require ‘next-generation regulations’ as well, since in this case the problems of scarcity has been replaced with the dilemma of abundance and complexity. When asked the regulator to comment on the above statement, PTA argues that “it is already preparing itself to handle the issues arising in the wake of an ongoing transition of networks from circuit-switching to packet-switching mode of communications.” The main challenges that the regulator perceives in result of this ongoing technological convergence and its impacts on the competitive landscape include: a better understanding of the standardization process, interconnection procedure, tariff structure, interoperability related issues, maintaining an acceptable level of QoS, and adjusting with the changing rules of competition (PTA, 2007)<sup>37</sup>. PTA claims that it has adopted the ‘technology neutrality’ principle in its regulations during the deployment of telecom networks, which has helped operators make a free choice without burdening themselves financially, thus creating a healthy competition in the industry. PTA resolves to conduct a fresh analysis with respect to the adopted accounting mechanism in this changing paradigm; in order to take appropriate measures for handling the traffic and billing related issues.

The regulator (PTA) further explains that it is well aware of the new emerging technologies in the telecom sector across the globe and is also watching the changing trends carefully. It believes that the current licensing regime is essentially based on the principle of ‘technology neutrality’. It aims at facilitating the introduction of new technologies in order to provide better services to the consumers. The regulator is satisfied with the current scale and pace of NGN deployment status in

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<sup>37</sup> Available at <http://www.itu.int/ITU-D/treg/Events/Seminars/GSR/GSR07/contributions/pak.pdf>

the country; while referring to the significant amount of investments recently committed by different telecom operators in upgrading their networks, in order to make them compatible with this technological transition. PTA informs that the cellular and LDI operators including the incumbent have already deployed NGN (PTA, 2007 b); as their core networks are now being replaced or integrated with NGN switches. Currently the telecom vendors like Alcatel, Nortel, Huawei, Siemens and Cisco are a few of the major companies whose equipments dominate in current NGN deployments in the country. However, the Chinese vendor 'Huawei' is reportedly leading among these equipment suppliers, as informed by different market sources. An interesting case was pointed out in case of the developing economies, that those countries (their firms and organizations) were able to adopt NGN more swiftly, as they didn't have yet committed heavy investments in the older technologies. In comparison, the US companies, e.g. took considerable time to complete their migration towards all-IP based NGN networks both at access & core networks' level (Bhatti, 2007).

The government's 'Deregulation policy' (2003) clearly states in Clause 12, that "the policy and licensing regime are proposed to be technology neutral and the LL/LDI licensees may employ any technology such as IP, VoIP, DWDM<sup>38</sup>, CDMA<sup>39</sup> and so forth, within the flexibility of license." However, under this specific clause, VoIP has been considered an illegal operation for those data operators (ISPs and broadband operators) who carry only the CVAS license for their data operations, since CVAS license allows them to only carry data but not the voice traffic. In response, the broadband operators loudly advocate for VoIP operation to be given the legal status; through submitting a consultation paper to PTA in favor of IP-telephony to be introduced in Pakistan with the legal provision in order to discourage the increasing trend of grey trafficking. They also demand for lifting up the restrictions on data operators in employing the VoIP technology. They critically argue that "everyone in the telecom industry favors the full-fledged introduction of IP telephony, apart from the fixed incumbent and the regulator; who declined the submitted proposal, even though all their objections and relevant concerns were logically addressed and responded." On the contrary, PTA argues that it doesn't discriminate among the differing market perspectives on conflicting issues; but rather it encourages conducting further consultations and debates on different issue with a range of stakeholders. Moreover, PTA informs that it keeps all the consultation papers on its website to let the opinion built on merit and not through any discriminatory or biased treatment of any case.

The broadband and cellular operators commonly acknowledge the fact that there could be two possible ways of dealing with the issue of increasing grey trafficking in the country. One way is to reduce the current rate of APC (and thus ASR as well) in order to encourage the incoming international traffic to follow the proper channels for call termination in the country, because the grey trafficking is like 'traffic smuggling' which occupies the network without paying anything; hence suffering not only the operator's business but also to the national economy. The other way is to legally and commercially adopt the VoIP business model in order to generate new sources of revenue through increasing the volume of traffic. However, the cellular operators consider that the

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<sup>38</sup> DWDM stands for 'Dense Wavelength Division Multiplexing'

<sup>39</sup> CDMA stand for 'Code Division Multiplexing Access'

respective concerns of both conflicting parties i.e. the incumbent on the one hand; whereas the LDI and broadband operators on the other hand, need to be properly addressed.

The LDI, cellular and broadband operators principally follow the line of argument that any segregation between the different telecom services based on the underlying access or transport technologies is essentially against the spirit of the deregulation policy and of technology-neutral regulatory regime. They assume that VoIP has both a legal and illegal status in Pakistan, since on the paper it has been given partially a legal status, but still it remains under the strict regulatory check. It was informed that earlier PTA had issued a policy paper allowing VoIP operations in Pakistan, but after a loud outcry by some operators, the regulator had to take it back informally; hence it didn't let the VoIP businesses flourish openly. The operators consider that these delaying tactics won't help and the ultimate destiny is a full scale migration towards IP-based networks. The author agrees on the fact that in the era of a technological and digital convergence, such restrictions and limitations seemingly reflect to an irrational and impractical approach. As a matter of fact, no government or regulatory regime can forever stop an emerging technology through creating such regulatory barriers, which would merely delay the adoption time; resulting in further deprivation of its population from receiving the benefits of the new technologies and innovative services.

#### *The Personal-Interest Driven Political Game*

Recently, a large scandal has been exposed in the newspapers<sup>40</sup>, where the current interior minister has been accused for illegally benefiting his own VoIP-based company, as allegedly registered in Europe with the name 'RodCom' (now renamed to 'Hollywell Solutions' after the scandal published in the papers). The company has been accused for conducting its illegal 'grey trafficking' operations through bypassing the proper channels, and thus to avoid paying ASR (currently stands at 10.5 cents/minute) to government on carrying the incoming calls from EU to Pakistan, under the protection of the above mentioned federal minister; thus causing more than Rs. 30 billion annual loss to the national economy. It is important to remember that the government still owns the majority shares in PTCL, which is the main beneficiary of the accrued ASR in terms of APC; hence this grey trafficking practice results in severe financial losses to PTCL, and thus to the government.

It has been reported that PTA earlier reduced the ASR from the previously settled rate of 20 cents/minute to 7 cents/minute during the first three years of telecom reform until late 2007. However, the current government (the government that took oath on March 2008) reversed this trend; and the ASR was again increased to the level 10.5 cents later on. It has been blamed in the media reports that government's this move was intentionally motivated in order to protect the corrupt means of generating revenues by discouraging the international carriers to route their calls properly through making interconnection arrangements with the incumbent (due to the increased ASR); and thus encouraging them to use the grey trafficking channels, which allegedly the interior minister's-led Company was controlling through its operations in Europe. It has been further

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<sup>40</sup> <http://www.dawn.com/wps/wcm/connect/dawn-content-library/dawn/the-newspaper/front-page/35-govt-loses-rs-30-billion-in-taxes-ak-03> (Accessed on Nov 23rd, 2010)  
<http://propakistani.pk/2010/06/15/rehman-malik-alleged-of-running-voip-telephony-network/> (Accessed on Nov 23rd, 2010)



suspected that probably it explains the reason why the telecom sector has been kept without any formal (regular) minister for the last more than three years. It may also provide an additional clue to understand why the IP telephony (VoIP) is facing the strict regulatory barriers; probably to let these specific political groups carry on their illegal practices to secure their personal financial interests; whereas, creating unbridgeable entry barriers for the other operators, who are willing to come into the VoIP business on the legal grounds.

## **6.9 Building Consensus through a Dialogue-based Forum for Setting up the Future Roadmap**

During the field work, it has been noticed that all the respondents came up with a list of suggestion and recommendations in response of the author's query for the proposed changes; in order to realize the desired changes and reforms within the telecom sector for its sustainable growth and development. However, most of those suggestions were actually entangled with multiple connected variables and issues relevant to different domains; hence that required a joint collaborative effort on behalf of all the relevant stakeholders in order to address those intertwined issues. It was found that the different actors generally find it relevantly an easier job to take the credits for the successes; whereas passing on the blames to others for the failures, and thus to hold others accountable for a range of still unresolved and contentious issues.

In the hindsight, the author recommends here to establish a large scale nonpartisan platform for a constructive dialogue in order to build consensus among the range of participants and discussants, whose interests could be aligned in result of these constructive dialogues. In these repetitive dialogue sessions, the participants should be let openly discuss all range of controversial issues while sharing their hearts and minds before each other in a friendly environment with a common spirit of serving the nation. The moderator of these dialogue sessions should be given the mandate to take decisions at the spot once the consensus seems to be developing on an issue; in order to avoid the undesired external interventions from the outsiders at a later stage attempting to distort the meanings and the spirit of the translated agreements. Establishing such a platform, preferably chaired by some mutually respected person (probably an elected person by the members of the forum themselves), is deemed particularly useful for those situations where the differing translations are being deliberately floated in order to distort the facts; as a norm to create confusions among the audiences for fulfilling the vested interests or personal gains. In such cases, it is common to see that everyone starts speaking loudly against the others; but no one seems to be ready to accept his/her own liabilities or to at least have the patience to hear the others' perspectives calmly and empathetically, even when it's the others' turn to speak. People are here generally fond of interrupting each other during the communication in order to get dominant in the 'monologue', than carefully listening to others as well and joining hands together for a bigger goal and larger agenda with a common vision and national spirit. People are often observed to have set their mindset beforehand; hence it's quite unlikely that they would really try to listen to the others' point of view with a spirit to reach to a consensus and mutual agreement, thus resulting in a win-win situation.



Hence, in such a situation the things cannot move on, until someone takes the lead (principally the MoIT and USF along with PTA) in order to bring all the important and relevant stakeholders on one platform, and to meet on regular intervals for setting up the future roadmap and a common vision for the development of telecom sector in Pakistan. The author further stresses here the dire need for a participatory and charismatic leadership with the essential skills of moderator and arbitrator in order to coordinate these dialogue sessions; so that to systematically progress towards consensus building in successively planned sessions, using iterative cycles of discussions among the engaged participants in a positive and respectful environment. The moderator should know how to bridge the existing trust deficit among the discussants, and how to inject a common vision and joint spirit among the contentious parties. Once this chemistry is achieved, the author firmly believes in the effectiveness of such dialogue-based consensus building forums; even it is considered more effective than making judgments based on the majority vote in a democratic fashion, what recently many critical scholars loudly advocate for, in case of the technological shaping and its diffusion. The operators and the telecom vendors were also found largely in favor of the establishment of such a ‘forum’ under the MoIT and regulator’s supervision, where the concerns of the different market players could have been given due attention; in order to ensure that no one could get advantage over others in an unaccepted way; and if someone was going to screw the market or the consumers through committing an anti-competitive practice, the others could reinforce their rights effectively.

A large cellular operator gives an interesting example about a presumed case of the failure of ‘mobile banking’ concept in Pakistan; where the State bank of Pakistan (the financial regulator) wanted the new mobile banking application to be a ‘Bank-driven model’, whereas PTA wanted a ‘Telco-led model’ to be implemented. Hence, in result of that conflict and the lack of consensus between the two regulators, none of the mobile banking models could have been effectively implemented. The academia also agrees with the author’s perspective on this issue, and it realizes the importance of establishing a discussion and consensus-building forum, especially for the larger scale initiatives. It has been argued that until a clear framework has been designed, and the specific roles and respective responsibilities have been further assigned to each individual participant with clear timeframe, after having mutually agreed upon the key issues and addressing those concerns; no theoretical suggestion or any ambitious proposal from any corner could be realized due to the observed lack of ‘social capital’ and prevailing high level of distrust and uncertainty in the society.

#### **6.10 The Excessive Governmental Taxes on Telecom Services**

There has been a mutual consensus among all the respondents asking the government to significantly bring down the currently imposed huge amount of taxes on the telecom sector (which has been often referred as among the highest in the region). The cellular operators mention that government collects 17% GST (also called as Value-added Tax or VAT) from consumers on the sold products and services; but the government collects taxes from the operators at the rate around 20% (including the activation and other taxes). The operators mention that not all the taxes are possible to pass on to the consumers; hence both the operators and consumers equally suffer from the currently imposed huge amounts of taxes.

A cellular operator gives an example that in case of the ‘activation tax’, the operators are asked to pay a fixed predetermined amount for each SIM card’s activation. On the other hand, the users receive the SIM cards comparatively at much reduced amount with additional free minutes of calling and SMS as part of the subscription packages (as operators are under the competitive pressure to offer these additional minutes). In this particular case, it is easier to understand why the currently high ‘churn rate’ hits so badly to the cellular operators. This is the reason why the operators run so aggressively the marketing campaigns to convince their current subscribers to ‘reactivate’ their unused or idle SIM cards within the given timeframe in order to get some financial incentives in form of free calling minutes and text messages. The cellular operators further argue that the situation even gets worse when the operators are asked to also pay their contribution for USF on account of the annual license fee, based on their existing ‘customer base’. In that case again the operators suffer due to the fact that the ‘theoretical’ customer base as commonly determined by the number of issued SIM cards substantially differs with the ‘actual’ customer base, when determined in terms of the regular usage and thus the generated ARPU.

It was further mentioned that the current government once imposed quite high tax on sending SMS; however, the decision was later withdrawn by cabinet after hearing a big roar in the media and among the public circles, and also due to expecting a ruling of Supreme Court against the newly imposed tax. Some circles also claim that the government’s this imposed tax on SMS was also aimed at discouraging the currently increased trend among the mobile users as using mobile messaging service for sharing ‘political jokes’ and revealing such facts that government feels against its political interest. Hence, the government presumably felt threatened by this ‘publicly-controlled’ an emerging P2P communication channel, since government was already scared of the increasing power and reach of the free electronic media in Pakistan.

<b>Telecom Contribution to Exchequer (Rs. in billions)</b>					
<b>Period</b>	<b>GST</b>	<b>Activation Tax</b>	<b>PTA Deposits</b>	<b>Others</b>	<b>Total</b>
<b>2003-04</b>	12.1	4.02	0.69	21.59	<b>38.40</b>
<b>2004-05</b>	20.5	7.53	17.71	21.38	<b>67.12</b>
<b>2005-06</b>	26.8	11.4	17.38	21.55	<b>77.13</b>
<b>2006-07</b>	36.28	17.6	9.72	36.95	<b>100.55</b>
<b>2007-08</b>	44.61	19.2	10.86	36.96	<b>111.63</b>
<b>2008-09</b>	49.35	14.2	9.15	39.3	<b>112.00</b>
<b>2009-10</b>	43.97	6.61	13.56	44.91	<b>109.05</b>

Table 7: Telecom Contribution to Exchequer

Source: [www.pta.gov.pk](http://www.pta.gov.pk)

The telecom sector is currently paying around \$1.3B annually (considering the currency devaluation over the years during this period of time) since the fiscal year of 2006-07 to the government on account of different types of taxes including the GST, Activation Tax and PTA deposits<sup>41</sup>, as table 7 illustrates. The respondents unanimously react on the government’s neglecting attitude towards the

<sup>41</sup> [www.pta.gov.pk](http://www.pta.gov.pk) (telecom/economic indicators – accessed on January 20<sup>th</sup>, 2011)

telecom sector, despite the fact that the telecom sector contributes this huge amount of taxes in the national exchequer. It has been sarcastically commented that this contribution from telecom operators to the national economy is literally comparable to what financial aid the Pakistani government annually receives from the US government on account of a publicly notorious and a humiliating contract known as the ‘Kerry-Lugar Bill’<sup>42</sup> that promises to give that annual aid in return of government’s unconditional subjugation and an active participation in the US-led so-called ‘War against Terrorism’. The respondents loudly demand their government to listen to the grievances of its own people and specifically the telecom sector; at least to the same extent how much it has committed itself to listening and following the US government in return of the payment it receives for its offered services for the accomplishment of the foreign agenda. The government has been further asked to substantially reduce the current scale of imposed taxes or at least it should properly facilitate the market players in delivering the telecom services. It has been demanded that government should significantly spend a reasonable portion of the collected taxes back on the development of telecom sector in the country.

### **6.11 The Social and Moral Issues Connected with the Usage of ICT Services**

The academics view the social, cultural and moral issues associated with the adoption of ICT services as an important impediment in the rapid and smooth diffusion of these services. It has been commonly observed that the available contents and different applications on internet are widely perceived by the parents and elders as essentially in contradiction to the prevailing social norms and cultural values, which were found often deep-rooted in their religious beliefs or in their local or tribal rights and rituals. Majority of the parents were found seriously concerned about the negative impacts of the misuse or an unnecessarily extensive use of ICT services on their kid’s moral values and ethical development; such as the fear of their kids’ premature exposure to nudity and pornography. Hence, most of the parents somehow try to put certain restrictions and limitations on their kids’ interaction with these services. The parents were also found extremely concerned about the negative impacts of the misuse and excessive of these services on their kid’s educational performance and focus on studies due to observing their lost attention and interest in studies, their gradual social detachment, laziness and health hazards, increasing dependence and engagement with these digital gadgets, mechanistic attitude and privacy related concerns.

There is found an increasing tendency towards offering a ‘gift economy’ sort of packages among the telecom operators and service providers, as they wrestle to grab the market share through particularly targeting the ‘youth segment’ which is apparently composing the largest part of consumer market. Pakistan’s demographic distribution reflects that the ratio of the teenagers and youngsters (under 30 years old population) composes of around 60% of the total population, whereas the country’s median age is just 21 years, hence reflecting an overwhelmingly young population. On the other hand, the percentage of population above 65 years old people only composes 4% of the total population. In result, the intensive marketing campaign targeting to the youth segment can be quite vividly observed from the types of applications and the special sort of packages offered and promoted through TV ads. This includes different sort of packages like: the

<sup>42</sup> <http://pakistaniat.com/2009/10/07/full-text-kerry-lugar-bill/> (Accessed on Dec 15<sup>th</sup>, 2010)

overnight free calling service, free talk between the limited family/friends' numbers, talking for free after each 2 minutes of call duration, and thousands of SMS for just nominal charges. It has been found that most of the marketing ads primarily project the fun & entertainment-led applications; such as downloading music/videos, chatting/flirting, encouraging the trend of needless talking, time unbound surfing and non-stop messaging.

However, the cellular operators consider that they are already concerned about these issues under the obligations of their 'Corporate Social Responsibilities' (CSR). A cellular operator mentions that it uses 'spam filters' to monitor the cases of privacy violation and to detect morally unacceptable contents on the generated traffic. However, the operators also highlight the possibility of the 'conflict of interest' even among the different user segments; for example, if parents dislike their kids to wake up over the night for talking or messaging with someone, but the kids would love to have this 'overnight' package any way; quite similarly as observed in case of availing different applications of internet services. The operators consider that the use of ICT could be only a small fraction of the total problem, hence these services cannot be held responsible for the whole range of issues; thus the whole society has to reform itself altogether through undertaking their respective responsibilities within their own premises respectively.

The above stated conflicting perspectives clearly reflect that the operators are more concerned about generating revenues than taking care of the social and moral issues, simply due to fact that they are profit making entities. Hence, it becomes primarily the government's (MoIT) responsibility to work with the regulator on these issues and effectively address the public concerns about the potentially negative impacts of ICT services on society. It has been mentioned that one of the purpose of establishing PIE (Pakistan Internet Exchange) was to filter the contents, as the government deems fit for its public. The incumbent PTCL announced in April, 2003 that it would be stepping up the monitoring of pornographic websites. In early March 2004, the Federal Investigation Agency (FIA) ordered Internet service providers (ISPs) to monitor the access to all the pornographic contents. The ISPs, however, excused themselves due to the absence of the required technical know-how to block those sites, and advocated that PTCL would be rather a better fit to carry out the FIA's requirement. However, since all the internet traffic is routed through PIE, so the local ISPs have also been ordered to block certain websites on their routers<sup>43</sup>. ISPAK, (ISPs' representative association in Pakistan) is however, principally against the data filtering saying that "from the very beginning, ISPAK had resisted the censoring of the Internet or the filtering of its contents at all available forums arguing that any such attempts at the country level would be simply a waste of resources. It had been debated that since the filthy material is already available abundantly in the local markets quite cheaply, therefore 'content filtering' would not be a solution. Hence, it was suggested that a social problem should be handled in a social way".<sup>44</sup>

The CCP's perspective on this issue is also in line with the ISPAK's point of view, considering that "the technological diffusion cannot be stopped by any means of blocking the technology in case of

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<sup>43</sup> [http://en.wikipedia.org/wiki/Internet\\_censorship\\_in\\_Pakistan](http://en.wikipedia.org/wiki/Internet_censorship_in_Pakistan) (Accessed on January 24th, 2011)

<sup>44</sup> <http://wiredpakistan.com/2006/06/interview-with-ispak-and-cybernet/> (Accessed on Dec 11<sup>th</sup>, 2010)

the broadcasting or publishing of undesirable contents over it; instead a positive diversion of attention by encouraging the use of alternative informative, interesting, relevant and useful contents should have been the proposed way in order to move forward and dealing with this challenge.” It has been also suggested that the parents and administrators should be given basic training and awareness about the effective use of setting the ‘parental control’ and using the ‘administrative mode restrictions’ on the ICT usage within the academic, office or home premises. This is deemed to be particularly helpful to build the confidence and trust of the parents, teachers and employees on the effective use of ICT services within the living, learning and working premises respectively.

The rapid diffusion and an extensive use of ICT services in a society have been commonly seen as a desired policy objective in order to make a swift transition towards becoming an information-led society. However, there is a serious flaw and a potential risk associated with this supply-led policy orientation for assessing the relative success in the diffusion of telecom services in a society. The author insists here that there is a need to properly assess the demand-side issues as well; and hence the resulting impacts of the diffusion of ICT services on the society in terms of their social, moral, political and economic implications. Therefore, the policy maker and regulator should assess the relative ratio of an effective and productive use of telecom services as compared to their excessive and misuse in different contexts in light of those projected scenarios that primarily worries the parents, elders, teachers and the employers. It is believed that if these issues are properly understood and addressed accordingly, it would significantly trigger the rate of ICT diffusion in the society, as all the segments of society would be then fully satisfied & convinced for the adoption of ICT services in an effective and productive way.

Here, finally the author advocates for a consistent and harmonious policy framework that could be effectively applied by the regulatory authority in order to achieve the desired objectives. For example, in case of the broadcasting of contents through electronic (TV/Radio), communication media (fixed line, mobile) and information media (Internet); the ‘contents policy’ should uniformly treat all those access and broadcasting mediums in order to maintain the necessarily required harmony and certainty in the adopted policy. It is particularly important since in the wake of an on-going ‘digital convergence’ within different ICT and broadcasting technologies, the same content is often being broadcasted through these different digital broadcasting mediums and access technologies; and thus trying to experiment different clinical treatments or attempting to enforce different regulations in each case separately would be an inconsistent and irrational approach. Hence, in order to enforce a ‘code of conduct’ or a specific regulation over the broadcasted contents, the enforced policy should be ‘content-specific’ but ‘technology-neutral’. The solution is not to block a specific technology but to control the contents used in different communication and broadcasting media; hence to use the different technologies effectively and innovatively to promote new avenues for the economic growth and social development.

## **6.12 Data Monitoring and Privacy related Issues**

This ‘privacy violation’ has been among one of the most controversial issues generally found as an equally relevant subject for both the developed and developing parts of the world. Especially, in the

recent years, the importance of this issue has been further highlighted through media reports and several public debates; where the legitimacy of data monitoring for the security or intelligence purposes has been highly questioned by telecom users and consumer groups. Data monitoring includes the monitoring, recording and unauthorized access to (or use of) the user's personal text/graphics (text messages, emails, chat, pictures), voice (phone calls using landline, mobile or IP telephony) and video footages, which are stored or shared on the internet with the selected people. The users were found highly concerned about this issue and they raised their voices for the abolishment of data monitoring practices at a level that is deemed like confiscating their basic 'right of speech and expression'. The privacy violation also includes the reception of spam and unwanted emails, messages and phone calls; particularly from the unknown sources, which really disturbs and frustrates the user at times.

About the privacy and traffic monitoring; there were however, different opinions when looked at the issue from the different vantage points of the respondents. The regulator admits that it does receive pressure from the government and law enforcement agencies to effectively monitor the users' data traffic in order to avoid the use of these communication means for any criminal or terrorist act. Hence; in this particular context, it was considered as more of a national security issue than of violating any individual's privacy. But it was also told that PTA did not force any operator for monitoring the user's traffic, apart from binding them to strictly implement the SIM card registration procedure. PTA mentions that it is rather more eager to monitor the operators' traffic in order to trace out and effectively deal with the international grey trafficking, which is routed through the local gateways established by the individuals, or occasionally by an established operator as well. The regulator further explains that the government at times intentionally passes such statements that it will monitor the voice and data traffic for the screening purposes in order to threaten its unwanted use, especially from the political perspective. It is because the government considers that some dedicated groups deliberately run such propaganda campaigns against it in order to destabilize the government and to create political anarchy in the country. It has been further told that recently the government had decided to monitor the text messages to discourage its usage as an effective medium for the political campaigning; but PTA mentions that it has a clear stance on it (at least in public) that it will not monitor the end-users' voice or data traffic. It has been mentioned that the government primarily use 'PIE' to keep track of all the incoming and outgoing e-mails, which by the parliamentary order as well are required to be kept in record for a certain period of time. It was mentioned that some security agencies such as FIA runs its 'cyber security cell', which is held responsible to check the use of communication services for any criminal or terrorist act. However, PTA didn't want to pass any further comment on it; whether or not and by what means, PTA collaborates with these security agencies in the voice monitoring and data screening operations.

The fixed and cellular operators' stance on this issue was clear that such monitoring does exist all across the world, even in the developed countries as well, which portrait themselves as the champions of the 'human rights' and for the 'freedom of speech and expression'; so this is not supposed to be a big issue in context of Pakistan, where the scale of political turmoil and the



security concerns are so high. The operators assume that such data screening will not basically affect the consumers' confidence to any noticeable extent while using these services, since it should be the criminal and not an ordinary citizen to get afraid of being heard or monitored. However, similar to the case of regulator, the operators also didn't want to speak loudly about their scale of operations and the collaborative pattern for working with the government and its security agencies for the voice and data monitoring of their users; but they do argue that they have not received yet any noticeable complaints from the consumers so far regarding this issue. From the policy perspective, the data supervision has been deemed acceptable only to a limited scale as per the national security is concerned; however, there is required to be declared a clear policy for ensuring not to violate the users' privacy in terms of the given 'freedom of speech and expression', which a democratic country must bestow to all of its citizens.

### **6.13 Security Issues and Law & Order Situation – Impacts on OPEX and FDI**

The provision of basic security and maintaining the general law & order situation has direct implications on the sustainability of business operations and economic activities in a country. The investments are considered at risk, where the essentially required political stability and security is not assured. It is observed that as the security conditions and the law & order situation start getting worse in a country; both the local investments and FDI drastically start declining due to the prevailing sense of insecurity among the investors. It also applies in case of Pakistan, as the tables 6 and 9 clearly reflect a sharp decline in FDI and total investments since the year 2008-09, when the security conditions got worsen due to an unending series of blasts and bombings across the whole country. Apart from the drastically reduced FDI, the OPEX has also been noticed sharply increased, particularly for the operators in result of an increased labor, fuel, power and transportation costs; due to encountering physical damages and also because of an increased spending on the provision of private security to protect the corporate assets, including the physical sites and installations.

The operators affirm that the bad security situation has had extremely negative impacts on their business operations and accrued revenues over the last couple of years. They mention that the increasing cost elements basically come from an increased labor cost, especially in the higher risk areas of operations; since in many occasions even their staff had been abducted and the ransoms were paid to release them, because the government has been failed giving any protection to their workers, as the operators further disclose. Apart from the 'no-go areas' (such as the tribal areas and many parts of the Baluchistan province), there are other areas which have been officially declared as war zones areas (such as previously the Swat valley and now the Waziristan agencies); where the government has even banned the provision of mobile services out of the security concerns during the military operations. It has been told by cellular operators that thousands of their potential sites were closed down due to the suspended services. They raise a valid question that if the current security situation in Pakistan resembles to Afghanistan or the other warzone areas; then why would an investor ever like to jeopardize its investment, since the investors do have much better alternatives within the South-Asian region to make safer investments. The regulator also admits the fact that in the present law & order situation, no operator or vendor would ever like to commit any further investments here due to the perceived higher level of risks involved with such investments.

Hence, the government must need to address these burning issues on priority basis in order to raise the level of confidence of both the investors and operators.

#### **6.14 Re-defining Broadband Benchmark**

The term 'broadband' has been often misused or confused within different context of usage, and there is noticeably a lack of common understanding to rationalize the relevant and correct use of this term. The benchmark set for the term 'broadband' in the developed countries is apparently quite different from the definition that has been adopted in Pakistan. For example in EU, the provision of 2Mbps speed has been generally set as a benchmark for having access to the broadband. However in Pakistan, according to the 'Broadband Policy' approved by the Federal Cabinet in 2004, the broadband has been defined as 'Always-On internet connection with a minimum download speed of 128 kbps connectivity.' In comparison to that, the Indian broadband policy (2004) mentions the benchmark set for the broadband as 'Always-On data connection that is able to support interactive services including Internet access and has the capability of the minimum download speed of 256 kbps to an individual subscriber'. This reflects that the broadband benchmark set for India is double than the broadband benchmark set for the Pakistani consumers, as per the policy documents issued in the two neighboring countries during the same year.

MoIT and ISPAK acknowledge the fact that as per the international statistics, such as the WSIS indicators, Pakistan is currently underserved in terms of the broadband penetration. This means that even the current figures about the status of broadband penetration (i.e. about 1.4 million subscribers) as recently declared by PTA (est. March 2011) is also highly questionable. On the other hand, the benchmark set for the mobile broadband services presents even a miserable case; as here the broadband has been named to the services provided on cellular networks known as GPRS and EDGE, which only support at maximum 56 kbps and 384 kbps of theoretical speeds respectively. However, the actual speed in the practical conditions barely supports half of the above mentioned theoretical data rates. Whether does this justify denoting the data rate of 128 kbps or even lesser than that as 'broadband'; if the users even couldn't experience the range of interactive, video-enabled and triple-play applications at this data rate? The next broadband policy is expected to profoundly take this issue into consideration in order to pave the path for the broadband diffusion in Pakistan in the real terms.



## Chapter 7

### Debating Major Issues Relevant to the 'Regulatory Domain'

This chapter presents an overview of the range of debated issues that were considered relevant and within the scope of the regulatory domain. The regulatory domain is primarily composed of the sector-specific telecom regulator (PTA) and the sector-wide competition regulator (CCP) whose respective roles will be discussed here in light of the respondents' feedback and with the support of other empirical sources of evidence within the context of local telecom industry.

#### 7.1 The Role of Telecom Regulator – An Analysis of Different Perspectives

The role of the sector-specific regulator is discussed in this section from different perspectives as discussed by the respondents and in the literature. Melody (1997) explains the role of regulator in historical context, with reference to its control over the public and private monopolies. He explains that historically the most commonly applied model for providing the public utility services was by a government protected monopoly, acting like an instrument of the government policy. It was generally believed that a monopoly could have achieved maximum economic efficiency by exploiting both economies of scale and also avoiding the duplication of facilities in delivering telecom services, hence telecom was traditionally considered a 'natural monopoly' industry. In addition to that, a monopoly supplier was thought to be providing a single focal point for the effective implementation of the government policy objectives. Melody (1997) further explains that in most of the countries, the above 'natural monopoly' model was implemented through maintaining the government's ownership over the PTTs (Postal Telegraph and Telephone), which were state-owned incumbents (such as previously T&T in case of Pakistan, which was later privatized and renamed to PTCL). Whereas in some other countries, particularly in the US, the regulation of private monopolies was rather seen a better choice for both avoiding the need for government to deploying substantial amount of investments in the supply of telecom services to public; but it was also considered a way to limit the scale of government's interventions and involvement in day-to-day operational issues and routine market affairs.

Etzkowitz (2007) sheds light upon the historical patterns of relationship between the State (government/regulator) and the industry (market forces). In light of his explanations, the above mentioned first model of protecting the state-controlled 'natural monopoly' was named as the 'Statist' model; whereas the second model of regulation of exercising the regulatory power over the market at an arms-length was named as the 'Laissez-Faire' model. In the first role, the regulator acts like a 'controller' and it is held responsible with a given mandate to strongly make use of its regulatory powers over the market, in order to enforce the delivered policies effectively. This regulatory role is deemed more suitable for implementing the 'regulation-driven market model'. However, in the second model, which is considered as the 'market-driven regulatory model'; the regulator acts more like an 'observer' at an arm's length by merely watching the self-functioning market, and thus it avoids making day-to-day interventions at an operational level in the market affairs, and only gets involve when there is an apparent evidence of 'market failure'.

Finally, there is a new realization about the emerging and desired role of an innovative, facilitating and proactive regulator that steps up a stage further from its previously understood marginal roles of being merely a ‘controller’ or an ‘observer’ within different contexts. The present author recognizes this emerging role of the regulator as ‘innovator’ in context of the proposed ‘innovation-driven regulatory model’. This envisioned role of regulator is primarily based on the spirit of consensus-building among a range of stakeholders on different issues through engaging them in a continuous dialogue-based process within an open, mutually respectful, empathetic and constructive environment. In this desired role, the regulator is expected to be more eager to finding avenues for such occasions in order to ensure an effective and smooth implementation of the policies, rather than being in haste of enforcing the delivered policies. Hence, the regulator is here expected to both create and facilitate the ‘occasions’ (e.g. discussion forums, joint projects and collaborative initiatives etc.) for the participating actors and relevant stakeholders during the innovation development and its diffusion process.

In light of the empirical observations and the respondents’ feedback, the role of telecom regulator in Pakistan apparently seems to be floating somewhere in between the suggested roles of ‘Controller’ and ‘Innovator’ at different occasions. However, largely the regulatory role seems to be more tilted towards the ‘Statist’ model due to the predominant authoritative political culture of the country, which often tempts the authorities to make an overwhelming use of exercising their power in order to forcefully implement the desired policies. In such a context, there is generally less scope and provision for developing and implementing policies with mutual consensus through employing the collective efforts of all the relevant stakeholders.

### ***The Emerging Role of Regulator in a ‘Technology-Neutral’ Regulatory Regime***

Over the past couple of decades, there has been observed major changes in the telecom market’s composition and the balance of relations between its composing elements. These changes are primarily due to following different market reform initiatives, the emergence of new access technologies, and thus an ongoing technological convergence among the previously considered separate technologies. Hence, it is becoming increasingly challenging to clearly demarcate the functional boundaries and to device different regulatory instruments for treating these converging technologies separately. For example, it seems now irrational and an impractical approach to make separate regulations (or having separate ‘regulators’ working independently) regarding the ‘broadcasted contents’ delivered through different mediums such as microwave, satellite, cable (coaxial/hybrid), optical fiber, cellular and IP-based access technologies. Previously different access technologies were dedicated primarily for specific types of communications; such as computers were largely used for data communications, fixed and mobile telephony for point-to-point voice communications, and radio/TV broadcasting for point-to-multipoint audio/video transmission. However, now it is observed that all sorts of data including the text, graphics, still pictures, voice, music and video are altogether transmitted by the same digital pipeline using different multiplexing techniques; no matter what physical medium or access/transport technology has been employed for the communication and broadcasting purposes.

Hence, it demands for ‘technology-neutral’ regulations, where the regulator is not supposed to favor any particular technology due to having any ‘preconceived-notions’ or ‘technological biases’ towards a technology. Instead, the regulator should prepare a level-playing field to let these different access technologies fairly compete with each other in the delivery of telecom services to consumers, based on common terms and conditions. Due to the increasing convergence between the computing, broadcasting, and telecommunication technologies, the previously defined boundaries are now blurring; hence it demands a renewed focus and a new understanding of the changing market dynamics, in result of the emergence of new market players and varying balance between their socio-political ties and economic relations. The ‘technology-neutrality’ issue shall be discussed again in section 7.12, where the possible implications of this concept upon the licensing regime are reviewed.

In order to effectively address these issues, the regulator needs to profoundly understand the changing market dynamics and the emerging realities; so that it could better adapt and adjust with the new regulatory requirements accordingly. Traditionally, a regulator has been considered as a ‘buffer’ in between the government and telecom industry; as primarily being used like a ‘regulatory instrument’ for the effective policy enforcement. However, due to being close to the market, the regulator may also advise the government on policy matters, based on its learning from market interactions. Hence, the primary task of regulator is to ensure the rapid and smooth implementation of delivered policies within their genuine spirit without letting any ‘distortion of meaning’ to occur during their implementation. In addition to that, the regulator is to also ensure maintaining the desired scale of balance between the ‘social’ and ‘economic’ objectives, as set to be achieved within the declared policies.

### *The Outcry for an Independent and Transparent Regulator*

The need for an independent and transparent regulator has been considered an obligatory and vital requirement in order to fully realize the benefits of telecom reform initiatives. The author presumes that if the regulator is financially handicapped and politically under the influence of government, then it would be much likely the case that there will be unwanted day-to-day intrusions from different political bodies and government officials for the fulfillment of their own vested interests. That will eventually hamper its reputation as an independent and transparent regulator, capable of providing a level playing field to all market players.

However, in this respect the operators largely do not consider the current regulatory regime as an independent and unbiased body, due to its overwhelming financial dependence on the government; and consequently an obvious tilting attitude towards protecting the interests of the fixed incumbent, since the government still owns majority shares in PTCL. The regulator has also been called highly vulnerable to external influences, especially to political interventions. The operators further inform that the regulator’s executive appointments are made by the government. Hence, they suspect that the regulatory decisions could likely be more politically motivated than purely based on the merit; assuming the country’s typical political culture with respect to decision making process.

The table 7 (presented in the previous chapter) clearly shows that the regulator generates handsome revenue on average around Rs. 13 billion each year from the market players only on the head account of 'PTA deposits' since the fiscal year 2004-05, which is deemed sufficient to run its all annual operational costs independently. However, as informed by some respondents, the regulator has to deposit that amount to government, as part of the collected taxes from telecom sector. Hence, this leaves the regulator financially handicapped and fully dependent upon government for acquiring the funds in order to continue its operational activities; and in result it raises a serious question about its regulatory independence due to following this ridiculous funding procedure. It is assumed here that this irrational approach towards funds' disbursement actually facilitates the external interventions and opens up the doors for the outside influences on the regulatory decisions, particularly from the funding authorities (in this case the government and its officials). In such a case the 'regulatory capture' seems an obvious consequence of the regulator's this overwhelming financial dependence on the political bodies; thus, the question is raised that how come the regulator shall be then expected to act as an independent, unbiased and transparent regulator?

It has been further told that even though in principle the ministry (MoIT) should not exercise its control over the regulator through passing any undue influence on regulatory procedures; but in practice, however it has not been the case. The operators also acknowledged the fact that there were occasions when some operators deliberately bypassed PTA, since the decisions taken by the regulator were not seen in line with those operators' financial interest; thus the operators consulted with MoIT in order to pressurize and exert external influence upon PTA on those particular occasions. Hence, it reflects the presence of existing procedural holes within the policy framework and regulatory structure due to which an operator finds it relatively easier to bypass one authority in order to get a decision in its favor by using the other authority, through intensive lobbying and politically pressurizing the different authorities using different channels.

The operators largely argue in favor of an independent and transparent regulatory authority, which could enact and facilitate the effective and efficient implementation of delivered policies, instead of being used as a 'fund collecting instrument' for government. The broadband operators denounce the classical argument of letting the market forces control the prices and regulate the market by themselves, particularly in context of the fixed line and broadband markets in Pakistan. They argue that such a market-led self regulatory model is only applicable when the targeted markets are fully functional, competitive and self-vigilant; however such a model is not deemed suitable or applicable to the cases where the markets significantly miss the above mentioned critically required elements of self-regulating phenomenon. The broadband operators consider the regulator's style of regulation as very dogmatic, assertive and formal, which are the typical attributes of official bureaucratic machinery; where delays in handling the cases become a norm due to the fulfillment of too much official requirements and bureaucratic procedures. The operators further indicate the presence of lacking the relevant experience and desired innovativeness within the regulatory case handling processes. The regulator has also been considered not fully impartial and unbiased in its approach; hence it has been accused for unnecessarily favoring the fixed incumbent. The operators mention that for the last four years, no foreign consulting services have been hired to improve the adopted

regulatory practices, in light of the internationally recognized best regulatory practices. In this regard, the operators also questioned the level of competence and scale of expertise of the local consulting firms, whose services have been frequently hired by PTA; considering the fact that they essentially lack the required international exposure to effectively guide MoIT and PTA on key policy and regulatory issues.

For the desired structural and procedural reform processes, the author here recommends that the regulator should have an elected (not an appointed) governing body, in which there needs to be a proper representation of all the industrial stakeholders, just like in case of the USF Company; in order to increase the scale of mutual trust and coordination between the key stakeholders of telecom industry during the policy enactment and its proper implementation. Hence, rather getting the political nominations and appointments by government for the key executive positions at PTA, it should have been ideally the mandate of the proposed governing body (the board members) to elect the regulatory executives, which should be held accountable primarily to its board, and then to the cabinet division with the mandate of a powerful and an absolutely independent regulator. Furthermore, it is also recommended here that the regulator should be made financially independent of the government by letting it to effectively make use of the accrued amount on the head account of 'PTA deposits' on its own discretion to support all of its overhead and operational costs.

#### ***Regulatory Interventions on Day-to-Day Operational Issues***

The operators show their concern that at many occasions the regulator behaves more like a 'controller' than a 'facilitator' while executing the regulations; and that attitude has been primarily attributed to the prevailing national psychic and the dominant cultural tendency towards over exercising the authority. The regulator has been asked to empathetically engage with the market players more like a facilitator. The operators consider that the regulator's inclination towards unnecessary intrusions within the operational matters, and over exercising its regulatory authority without considering the genuine concerns and real issues of the operators would likely further increase the existing gap and trust deficit among the regulatory and supplier domains. They recommend the regulator to keep its focus on the achieved results and the resulting impacts rather than unnecessarily policing about the operational details, which should be principally left for the suppliers to deal with.

Asserting to the point further, the operators condemn the regulator's too much involvement in day to day operational details without knowing the ground realities. The cellular operators highlight such occasions of operational intrusion by giving the example of the issued 'show-cause notices', as asking the operators to improve their QoS in response to the customer complaints received to its 'complaint cell'. But the operators argue that the regulator neither properly understands nor it can address the root causes of those macro-economic issues, which actually hamper the delivered QoS; whereas addressing to those macro-economic issues are also beyond the scope of operators. The cellular operators further comment that they are completely aware of the grave consequences of the declining QoS, especially in the presence of an extremely competitive market, but there are certain

limitations for the operators as well, which are required to be properly understood and acknowledged by regulator.

MoIT seems to be generally satisfied with the role of regulator, as considering PTA an effective regulator but it also acknowledges the operators' grievances by saying that the regulator sometimes try to be outsmart by intervening into the supplier's day to day operational issues at a micro-management level; instead of just looking at the end results to make them in line with the spirit of the enforced regulations. The ministry further speaks in favor of the operators in this regard commenting that the operators want some flexibility and space to maneuver their strategic choices, particularly when competing in such a fiercely competitive market, particularly in case of the cellular market. MoIT argues that the regulatory interventions are more desirable where the competition is seen to be yet not fully flourished, such as in case of the fixed line and internet services, since in that case the dominant incumbent has a greater possibility of distorting the market competition through exercising anticompetitive practices.

### *The Appreciated Roles of Regulator*

However, the cellular operators also view the regulator's role in a positive light, particularly during the deregulation and market liberalization processes, where new licenses were issued on competitive terms to the cellular operators in order to open the market for foreign investors. That was essentially considered a milestone achievement within the regulatory history of Pakistan, resulting in the recently experienced rapid growth of cellular market. The cellular operators also admire the regulator for facilitating them deploying their networks and infrastructure across the country, especially in the early years (2003-07) of telecom reform, which eventually resulted in a phenomenal growth both in the network developments but also in terms of an unprecedented increase in the cellular customer base. This rapid growth in the mobile sector has been called helpful in creating significant number of jobs, in addition to giving a new exposure to the masses particularly to the youngsters about the emerging mobile technologies.

The regulator's website has been commonly appreciated by the respondents and also in a survey report conducted by LIRNEasia. The contents available on PTA's published reports and its website have been generally considered as a reliable and informative source about the ongoing telecom activities and developments in the country. The contents available on the website include policy document, regulatory details, consultation papers, 'complaint cell' corner, telecom indicators, and other relevant information and updates about the recent developments within the telecom sector. Despite the fact that over the years, there have been several times when the author himself observed and pointed out the regulator about the issues faced like the presence of inactive links, page composing problems, some statistical mistakes, and often facing unacceptable delays in page browsing; however still the regulator's homepage can be considered as a good site for acquiring an authentic information for reference purposes. In addition to that, the regulator's PR (Public Relations) department seems to be working actively in spreading the telecom related news and maintaining market relations with different stakeholders, particularly in relation to their 'image building' efforts among the telecom users and general public through effective use of media. The



regulator's spokesperson further explains that different activities are performed in order to establish and maintain relationship with the media and public. These activities include: maintaining detailed records of the broadcasted and published news reports through 'news clipping'; issuing press releases and advertisements to highlight PTA's decisions, activities and new initiatives; regularly meeting with the reporters, ad agencies and public representatives; visiting to different press and media channels; organizing press conferences and public gatherings; and arranging national level workshops for the media personnel on telecom related issues to increase awareness among the masses and targeted groups of audiences.

The respondents of the telecom market have also generally appreciated the regulator's active engagement in organizing various seminars and conferences on topics related to the recent developments within the telecom markets; and in result the emerging telecom issues and challenges, particularly within the local context. For example the recently held 3G seminars<sup>45</sup> in three different cities with the collaboration of foreign vendor and operator firms were found useful in creating awareness among the telecom market, media and general public about the emerging cellular technologies through inviting foreign delegations and speakers at these occasions, to let them share their insights and experiences with the local industry. In this regard, the proactive role of regulator at different occasions has been also appreciated; such as in case of its recent initiative of establishing a Broadband Stakeholder's Group (BSG) in order to provide a common platform for broadband experts and to facilitate the new entrants. PTA has also organized last year a conference in collaboration with Motorola on the subject 'Promoting the ICT Sector'. It was reported (PTA, 2010) that the content developers and leading ICT experts of the country were gathered at this elite platform in order to discuss the ideas, applications and latest innovations in developing local contents and applications. Furthermore, the leading content developers displayed their applications, aimed at benefiting the local community; and thus to help increasing the broadband penetration in the country. In addition to that, the regulator has also been admired for introducing some interesting applications and services for the consumers' convenience. CCP informs about one of such interesting services as recently introduced by PTA, where it provided a software to all public sector's academic institutions that essentially facilitates the teachers and administrative staff of those institutions in communicating with the students and their parents using free of cost SMS service; in order to share any information or updates regarding different academic activities, such as the changed lecture or exam schedule, assignment submission time, and the rescheduled opening or closing timings of those academic institutions.

## **7.2 The Role of Competition Commission of Pakistan (CCP)**

The Competition Commission of Pakistan (CCP) is an independent quasi-regulatory and quasi-judicial body that helps ensuring healthy competition between companies for the benefit of the economy. The Commission (also known as 'competition regulator') prohibits abuse of a dominant position in the market (monopoly), certain types of anti-competitive agreements (cartels), and 'deceptive marketing' practices (trade abuses). It also reviews Mergers & Acquisitions (M&A) that

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<sup>45</sup> <http://www.telecomrecorder.com/2010/12/28/pta-to-organize-seminar-on-3g/> (Accessed on January 30<sup>th</sup>, 2011)

could result in a significant lessening of market competition. Combined with its advocacy efforts, the Commission seeks to promote voluntary compliance; and hence to develop a ‘competition culture’ in the economy. The aim of CCP is to establish and maintain healthy competition across the economic sectors in order to ensure a level playing field for all the market players.

As per the information provided on its website<sup>46</sup>, CCP was established on October 2007 under the Competition Ordinance (2007), which was then re-promulgated in November 2009. The major aim of this Ordinance is to provide a legal framework for creating a business environment based on healthy competition for improving economic efficiency, developing competitiveness and protecting consumers from anti-competitive practices. Prior to the Competition Ordinance (2007), Pakistan had an anti-monopoly law namely ‘Monopolies and Restrictive Trade Practices (Control and Prevention) Ordinance’ (MRTPO-1970). The Monopoly Control Authority (MCA) was the organization to administer this Law. However, CCP informs that in the fast changing global and national economic environment, the MCA regime was inadequate to have addressed the emerging issues related to the competition effectively. It has been told that MCA was not able to meet the expectations of the businesses and consumers, especially after the market reform processes that resulted in a liberalized economy. Hence, those unfolding events encouraged the government to provide a comprehensive competition policy framework for the private sector in order to promote and protect competition and innovation across the economic sectors.

CCP further states that in line with the other modern world’s competition regimes, the competition law as adopted in Pakistan follows a ‘carrot and stick’ approach i.e. providing ‘incentives’ and acknowledgments in case of compliance by the market players; otherwise the law provides the legal provision to impose large fines combined with imprisonment in case of non-compliance. Hence, in order to maintain a higher standard of evidence for unearthing the secret cartels and anticompetitive market collusions, CCP holds the legal powers to conduct various required means of relevant searches and inspections.

### *The Execution of ‘Competition Laws’ by CCP on Sector-Specific Cases*

It was informed by the competition regulator that as being primarily a sector-wide regulator, CCP initially waits until the results of the taken actions by sector-specific regulator (PTA) are carefully observed on an issue, deemed as relevant to establishing and maintaining competition within the telecom sector. CCP mostly interferes in a ‘reactive’ way (i.e. once the complaint has been filed by the victim); hence CCP works within the ‘ex-post’ regulatory framework, apart from the cases relevant to the foreseen merger & acquisition (M&A) in which case the commission may take actions proactively before an expected merger or undertaking has taken place. On the other hand, the sector-specific regulator works ‘proactively’ (often before the happening of an incident) by using the ‘ex-ante’ regulatory instruments. Hence, apart from the M&A cases, CCP only reacts when it notices that the sector-specific regulator has failed in establishing competition or stopping an accused anti-competitive practice in the telecom market.

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<sup>46</sup> <http://www.cc.gov.pk/> (Accessed on December 28, 2010)



Here some cases will be discussed in order to highlight the role of CCP in establishing competition in the telecom sector over the past few years, as reported by the operators, regulator and the commission itself. In the first case, CCP went against a couple of cellular operators who were found guilty for 'deceptive marketing'. In those cases, the operators were accused for making claims in their promotional ads on media but without providing any documented evidence for their claims; or in other cases publishing/broadcasting unclear ads which were potentially deceiving the consumers due to incomplete provision of the required information. In some occasions the important part of the information (from the consumer point of view) were deliberately kept hidden or made confused with the other facts in order to grab the customers' attention at the first place. In the second described case, CCP took action against four out of the five cellular operators under the charge of imposing un-notified charges on consumers for a specific service, and furthermore for being engaged in making a sort of potential cartelization or collusion in order to control the market prices. In the third case, CCP went against the mobile incumbent and another cellular operator for their attempt for 'product bundling'. In that case, those operators tried to restrict their consumers to use the sold SIM-locked handsets exclusively for the specific services provided by only those operators; even without having signed any contract beforehand. In the fourth case, CCP went against the fixed incumbent PTCL which introduced a new 'plain rate NWD calling package' where the customers were presubscribed for that nationwide calling package giving them a fixed amount of minutes to call anywhere in the country at fixed cost. In that package, neither the 'opt-in' choice was given (since the customers were considered to be already subscribed for the package even without fulfilling the formal requirements in response of the subscriber's request for the service); nor the 'opt-out' option had been provided to let the customers get out of the package following a simple procedure. This service was considered anti-competitive also from the 'price squeezing' and the 'predatory pricing' perspectives, since it left the other 'prepaid calling card operators' with no choice but to eventually quit the fixed line market.

Despite the CCP's this active role in both the fixed line and the cellular markets as explained above, during the three years' short timeframe since its establishment in 2007; however, the cellular operators do not acknowledge any critical role for the commission in cellular market, considering the fact that the cellular market is already quite competitive with rare chances for any significant anti-competitive practices to occur. The regulator shares the cellular operators' perspective in this regard and it also doesn't acknowledge any critical role for CCP within the telecom sector. The cellular operators consider that it should not be principally the CCP's mandate to resolve the consumer related issues in the presence of a vibrant 'consumer associations' platform and an active sector-specific regulator, who are primarily held responsible to take care of the consumer's concerns. However, gradually it seems like these consumer related issues are becoming more and more an integral part of the commission's larger agenda, probably due to the weaker role of the 'consumer's associations' in Pakistan, as stated by the operators. It has been further disclosed by an operator that there are higher level talks going on between the government officials to move towards establishing an internal alignment between the parallel regulatory authorities such as PTA (sector regulator), CCP (competition regulator), PEMRA (media regulator), FAB (frequency

regulator) in order to create a proper balance and a fine tuning after precisely delineating their given operational mandates and frameworks.

### *Resolving the Issues of 'Role Conflict' and Dispute Settlement*

Despite the fact that both the sector-specific (PTA) and sector-wide (CCP) regulators have their own mandates and regulatory instruments to use on specific occasion; however, at times it is possible that their operational boundaries may blur with each other for the obvious reason that both have one thing in common as their integral part of agenda i.e. establishing competition and curtailing anti-competitive practices. In those occasions where such role overlapping or the 'role conflict' issue may appear, it seems relevant to find out what mechanism or the procedures have been set to be followed within the regulatory framework in order to handle those situations. CCP explains the fact that so far the 'personal relations' between the executives of the respective authorities have been successfully used in order to avoid any conflict between these two institutions. However, in case if such a personal level understanding didn't have existed, the situation might possibly turn into a conflict, especially in the absence of any prior agreed specific set of protocols to follow in order to resolve those conflicting situations. The author assumes that the issue will likely get further attention when there will be an increased occasions for the CCP's involvement; and thus an increased acknowledgment by market players for its significant role and mandate within the telecom sector.

CCP highlights couple of such occasions, where such incidents of 'role-conflict' actually did occur in the recent past. In the first case, a large cellular operator started SIM-locking of even the personally owned handsets. In a country where more than 97% of the subscribers have the prepaid subscriptions; blocking a personally owned handset with one specific operator for unspecified period was considered an anticompetitive practice; hence CCP (at that time called MCA) took action against the operator by sending a 'show-cause' notice, as asking to comply with the competition rules and accordingly withdraw the 'SIM lock' condition. Instead of following the CCP's ruling over this issue, the operator rather went to consult PTA in that particular case and influenced it to come up with its own sector-specific regulation, to resolve this issue in its favor. In response the sector-specific regulator made its own note on the issue and accordingly sent to the higher authorities (i.e. MoIT and Cabinet Division). This way it became a point of controversy between the two regulatory authorities. It was further mentioned that a similar sort of experience had been earlier observed in handling a case within the banking sector, where the financial regulator (The State Bank of Pakistan) did interfere with CCP's ruling while adding its own note on it, which was later resolved in result of a cross-institutional dialogue between the two regulators.

However, CCP argues that since the introduction of sector-wide competition regulation is relatively a newer experience here; hence it would take some time before the different regulators and institutions would properly realize and recognize each other's roles and functional boundaries. Moving towards this direction, the Chairman CCP has established a 'consultative group' which regularly meets the different stakeholders engaged in the process, including the different sector-

specific regulators in order to develop a better understanding about their points of view on different issues and specific cases, to help creating harmony and building consensus among them.

However, PTA doesn't find any conflicting situation with CCP so far; nevertheless it reiterates the fact that CCP only makes such interventions in sector-specific cases, when there is a real need, and presumably with good intentions. PTA admits the fact that due to the general nature of our political system, the government officials and politicians attempt to use their power through unjustified means to put their influence on the regulatory affairs; so they could protect and promote their own political and economic interests. An example was given in this context that if CCP or PTA takes action against some private company or an organization; the under trial company then uses other channels to influence over the regulatory decisions through lobbying and using their personal contacts with some key politicians and ministers, and that has been unfortunately called a typical way of protecting personal and business interests in Pakistan. This prevailing political and business culture unjustly favors the powerful elements in order to protect their particular interests by overruling the established and due procedures; and hence taking advantage of the common excuse of 'exceptional situations'.

On the issue of political interventions to influence or avert the CCP's decisions taken against the powerful groups and market players; CCP acknowledges the fact and argues that such conflicts and incidents have been witnessed in the past. CCP further discloses that different groups and individuals try to influence the hearings in order to turn the decisions in their favor or to protect themselves against any counter decision; such as in the cases of the 'Sugar mafia' and 'LPG' (Liquefied Petroleum Gas), where big political and financial stakes were involved. But CCP here refers to a good sign that goes in favor of an independent regulator; and that is the recent emergence of a powerful and transparent judicial set up in Pakistan, which supports and encourages the institutions to freely make decisions based on merit. CCP again insists that since this is relatively a new thing to practice here, so it should be considered as a learning process for both the commission and the Judiciary to resolve the cases purely based on the merit with mutual collaboration. Finally, CCP highlights the significance of interpersonal relations and informal contacts in disputes settlement, giving the example of an international forum called 'International Competition Network' (ICN) where all the representatives and delegations from different competition authorities across the world meet to discuss their respective issues and share their opinions in order to learn from each others' experiences and to reach to some consensus on the discussed issues. It has been told that even in such an international scale, these interpersonal relations between the key individuals play a critical role in the decision making and consensus building processes.

### **7.3 Establishing Competition and Curtailing Monopoly & Anti-competitive Practices**

Establishing fair and free competition with the provision of level playing field for all the market players, while curtailing the incumbent's monopoly and the anti-competitive practices of dominant players has been increasingly discussed within the policy debates as an accepted wisdom (Melody, 1997); whereas designing tailored regulatory instruments suitable for establishing competition also

remains the crux of all regulatory debates (Intven, 2000). The increasing trend across the world for setting up the ‘competition authorities’ in addition to already having sector-specific regulators is an empirical evidence for the growing acknowledgment of the fact that ‘competition has been considered a vital means for the sustainable market growth’. The author presumes here a positive correlation between ‘competition, innovation and consumer benefit’; since as a matter of fact the reduced entry barriers, and hence the increased competition generally encourage the existing players and the new market entrants to come up with new stream of innovative ideas in order to differentiate themselves and create niches (blue oceans) within the highly competitive (red-ocean) markets, and thus creating more variety and choices for the consumers. In the following section, the current competitive status of different telecom markets in Pakistan has been discussed using Herfindahl-Hirschman Index (HHI) in order to first have an overview of the overall picture.

### ***Market Concentration & Competition Analysis using Herfindahl-Hirschman Index (HHI)***

HHI is used to measure the size of competing firms in relation to overall market size, which indicates the scale of competition among them; hence HHI can also be named as the ‘competition index’. As named after the economists Orris C. Herfindahl and Albert O. Hirschman<sup>47</sup>, it is an economic concept widely applied for the competition analysis. The index is explained as

$$H = \sum_{i=1}^N s_i^2$$

Where,  $S_i$  is the market share of the individual firm ‘i’ within the focused market and N is the number of firms competing in that particular market. HHI fluctuates in between 0-1 when the competitors’ market shares are presented in fractions; or in between 0-10,000 if the individual shares are counted in terms of percentage of the total market shares. The upward move in 0-1 scale indicates the market transition from a relatively competitive to a further concentrated market, as further explained below.

- ➔ H index below 0.1 (or 1,000) indicates an un-concentrated index i.e. fully competitive but highly fragmented, which however doesn’t necessarily reflect the market’s stability.
- ➔ H index between 0.1 to 0.18 (or 1,000 to 1,800) indicates a moderate concentration with relatively more stable competition within a highly competitive oligopolistic market.
- ➔ H index above 0.18 (above 1,800) indicates high concentration in the market, which eventually leads towards a dominant and monopolistic market as the index scales up.

The calculated HHI for different telecom markets in Pakistan has been mentioned below. These calculations are based on the statistics mentioned on the regulator’s website<sup>48</sup> (est. Oct. 2010). The cellular market is composed of 5 head-to-head competing operators, with none can be declared as SMP (Significant Market Power - if ‘holding 40% of market share’ as per the definition used here); even though one market player has had the SMP status in the past. This indicated that the cellular market is increasingly getting competitive, and actually it has turned into a very strong ‘competitive oligopoly’ which apparently seems like a desired scenario from the sustainable competition and market’s stability perspective, instead of having a largely fragmented market with dozens of

<sup>47</sup> [http://en.wikipedia.org/wiki/Herfindahl\\_index](http://en.wikipedia.org/wiki/Herfindahl_index) (Accessed on December 10, 2010)

<sup>48</sup> [www.pta.gov.pk](http://www.pta.gov.pk) (Accessed on February 2<sup>nd</sup>, 2011)

competing operators. However, the future expected mergers and acquisition (M&A) in result of the ongoing fierce competition and the declining ARPU may turn this market into a 'tight oligopoly' with further concentration.

On the contrary, the fixed line (landline) market has apparently 6 competing players as documented in the regulator's website; but in fact the landline services market is an overwhelmingly dominant and a total monopolistic market, with just one player having more than 95% of the total market shares. Whereas the fixed-wireless (WLL) market is composed of 8 competing players, but in essence the collective shares of the first three large operators exceed 90% of the total market shares; hence it also reflects a highly concentrated 'tight oligopoly'. Finally, the dialup modem based (narrowband) internet market doesn't create any competitive scenario at all since only the fixed incumbent PTCL controls the total market as a single supplier; hence it's considered to be a full 'monopoly'. Nevertheless, the dialup market is continuously sliding downwards and it is facing a gradual decline over the years; especially after the strong emergence of the broadband markets.

In the dialup market (the narrowband internet services), PTCL remains the only supplier, but this service is expected to become soon obsolete since there is no longer any further growth or any demand left for this very slow data rate service, after the advent of broadband access solutions. The data provided by the regulator on its website and in its last annual report released for the year 2010, highlights the growth trend and the competitive status of broadband markets both in terms of different access technologies (such as DSL, WiMAX, EvDO, FTTH, HFC) and the individual market shares of the competing firms. However, among these technologies, DSL has been called the largest access technology with 53% market share of the total market, but the wireless broadband technologies (WiMAX & EvDO) have also been reported as most rapidly growing broadband access technologies with a collective share of 41% of the total broadband market. On the other hand, there has not been observed any further growth within FTTH and HFC based broadband solutions; and even a decline of 4% in their collective share has been mentioned in the annual report. FTTH and HFC are only available in limited number of metropolitan cities within selected areas. The limited growth of these fiber based technologies is primarily attributed to its fixed nature, the limited access (due to the prohibitive costs of countrywide network deployments), and to the excessive service charges at the consumer-end.

The current competitive status of the broadband suppliers (as per the individual market shares mentioned in the annual report 2010) essentially reflects the presence of a dominant market, which is gradually moving towards becoming a competitive market. The report illustrates that PTCL still holds the SMP position with 53% of the market share, followed by Wateen Telecom with 21%, and then WorldCall, WiTribe and LinkDotNet with 11%, 6% and 4% shares respectively. The rest of the 5% share as mentioned under the 'others' category is here further divided presumably among 2 other small suppliers for the subsequent analysis. As discussed above, the broadband market essentially reflects a 'dominant market' at this stage. However; in future this market is likely to become a 'tight oligopoly' if the market was further opened up in result of resolving the critical issue of the incumbent's existing control over the internet exchange, and also if the other variables

were successfully aligned in order to create favorable market conditions for competition. One additional factor that goes in favor of the current pattern of the broadband market development here is the fact that the domestic market offers not just a ‘multi-operator’ but also a ‘multi-technology’ competitive landscape that would presumably create another ground for establishing competition.

Here following the HHI analysis has been used to explicitly indicate the current status of competition within different telecom markets in Pakistan. An interesting inference can be made here out of this analysis that in all those markets where wireless means could have been adopted as access technologies have generally experienced rapid growth and market competition such as in case of cellular, WLL and broadband wireless markets. On the contrary, in other cases where only the wired or fixed means could have been deployed, those markets still remain predominantly under the monopolistic control of the incumbent such as in case of the copper-based internet (dialup & DSL) and landline voice telephony markets. Hence, it leads to a presumed fact that ‘go-wireless’ would eventually become an obvious choice for the pro-competitive regulatory regimes.

$$\text{HHI (broadband market)} = 0.53^2 + 0.21^2 + 0.11^2 + 0.06^2 + 0.04^2 + (2 * 0.025^2) = 0.3435$$

Telecom Markets	HHI	The Competitive Status of different Telecom Markets with Projected Future Scenarios
Cellular	0.232	‘Competitive Oligopoly’ but is likely to make a backward transition towards a ‘Tight Oligopoly’ with further concentration (consolidation) in future, in result of the expected mergers and acquisitions (M&A) due to the fiercely cut-throat price competition and declining ARPU
Fixed-Wireless (WLL)	0.325	Currently a ‘Tight Oligopoly’ but is likely to turn into a ‘Competitive Oligopoly’ due to an expectedly further increased competition
Broadband	0.3435	Presently a ‘Dominant (SMP)’ market, but will gradually become a ‘Tight Oligopoly’ if the other pro-competitive variables were made available to help establish further competition in the market
Fixed (Landline)	0.912	An ‘Overwhelming Dominant and Monopolistic’ market with no sign of change in the current status of the market competition in near future

Table 8: Telecom Market Competition Analysis using HHI Index

Source: Author

### ***Arguments against the Market Dominance (Monopoly) and in Favor of Competition***

In line with the above explained facts, the need for establishing a full-fledged competition has been discussed with a large pool of significant market players to collect their perspectives on the issue. The discussion remained around the central question that how come the experience of successfully establishing competition within the cellular market couldn’t be replicated in case of the fixed line and broadband markets? The stagnant growth of fixed line (particularly now the continuous decline in landline subscriptions) has been generally attributed to the lack of competition in the fixed line sector, which is linked with the prevailing market dominance and monopoly of the fixed incumbent. The competing telecom suppliers and CCP were quite outspoken in pointing out that the fixed incumbent had been traditionally protected by the government and sector-specific regulator in order to maintain its ‘natural or legal monopoly’; but in result of such legal protection, the growth of

competition both in the fixed line and internet services was observed severely hampered. It has been told that the mobile sector growth was primarily due to the sector liberalization 'in real terms', where an increased competition and its resulting benefits could have been witnessed by everyone; whereas the fixed line sector has been let highly concentrated and overwhelmingly dominated by incumbent. The fixed incumbent has been accused for enjoying unjustified favorable conditions through its control over the essential facilities. In result, the current market dominance didn't let a level-playing field to have established for other competing players and new entrants to compete on equal footings; the way the cellular market did flourish under competitive market conditions.

The cellular operators blame the fixed incumbent PTCL for overshadowing and influencing the telecom ministry and regulator using different channels at organizational and personal levels. Some examples were given by the operators in support of their argument. It was disclosed that at an occasion a very high ranked regulatory official quit his public office and immediately joined a senior management position in PTCL; hence, it was considered a typical case of the 'regulatory capture'. In economics the term 'regulatory capture' is commonly used to referring to an undesired situation where a state regulator acts in favor of an industry player due to having some political or financial interests in that particular market player, or because some of the key officials are motivated by seeking their career prospects in that supplier firm. The regulatory capture has been considered the 'government failure'; somewhat similar to the concept of the 'market failure', for which the regulator is actually appointed to take care of. The higher susceptibility of a regulator to get trapped into such forms of 'regulatory captures' actually entices particularly the larger firms to expect for receiving privileged treatment and unjust benefits from regulator, by sneaking such opportunities in order to influence the regulatory decisions.

Giving another example, the operators referred to a past case of the PTCL privatization time, when the fixed incumbent found the ministerial or the regulator's one decision against its interest, so it went to the 'privatization commission' in order to get the decision in its favor by giving the impression that if the incumbent's concerns were not addressed, then Etisalat (the investing company) would simply quit from the privatization deal and stop paying the residual payments. However, the cellular operators acknowledge the fact that PTCL has been relatively difficult to deal with before its privatization, but the situation has now significantly changed under the competitive pressure due to the access availability of multiple backhaul fiber networks, as recently deployed by other competing operators over the past few years. It was further mentioned that before the emergence of current competition within the backhaul data transport networks, PTCL has been very slow in responding to the interconnection requests. The cellular operators expect the broadband market to become a full-blown competitive market, if the current control of fixed incumbent over the essential facilities and basic infrastructure is made significantly reduced by the regulator, in addition to introducing an effective 'unbundling of local loop' regime.

The broadband operators accuse that the fixed incumbent has been given a free hand in setting the prices for leasing their lines and giving access to 'co-locations'; on the other hand, the other operators have been thrown in to an intensive 'price war', which is squeezing their profits day by



day and making even their survival a question mark in this increasingly competitive market. They argue that the deregulation policy clearly states that the ‘accounting separation’ would be enforced on the incumbent within 3 years after the policy takes effect, but now even after 7 years passed since the policy was issued, the accounting separation didn’t yet fully take place in case of the fixed incumbent due to the weak regulatory enforcement. The broadband operators further accuse that the fixed incumbent has been often unjustifiably protected like a ‘state-nourished baby’, which has been considered totally unfair with other competing operators. It was mentioned that under the state protection and the given privileged incentives, PTCL at its peak time during the year 2003/04 even enjoyed Rs.75B gross revenue with Rs.30B net profit (40% of the gross revenue), which had no comparison with the fiscal conditions of its competing operators. The broadband operators also criticize the fixed incumbent’s role in strongly opposing the proposal (consultation paper) submitted to the regulator in favor of providing the legal provision to IP telephony.

The competition regulator (CCP) also assumes the fixed incumbent’s role quite dominating both within the fixed line and internet markets due to its overwhelming control over the ‘essential facilities’ (e.g. the central internet exchange) and the ‘last mile’ copper network; which actually give the incumbent an unfair advantage in bargaining with the other players when dealing with the interconnection related issues. It has been told that PTCL controls the total supply-side vertical value-chain from top to bottom i.e. controlling the vertically integrated both the upstream and downstream services. This control gives the incumbent a clear advantage over its competitors; since it can offer the most competitive rates for its delivered services in all sort of business segments; including the fixed local loop (LL), wireless local loop (WLL), long distance calling both nationwide (NWD) and international (LDI), narrowband internet, fixed line broadband (DSL and fiber-based), wireless broadband (EVO), cellular mobile (through its subsidiary firm PTML operating with the brand name ‘Ufone’), and also offering cable TV and smart TV (IP-TV) – ‘all under the single umbrella’. It has been suspected that this overwhelming control over the essential facilities and the total supply-chain may open new possibilities for the incumbent for gaining unfair advantages over its competitors through possibly engaging in anticompetitive practices such as; product bundling, cross-subsidizing, predatory pricing and price squeezing in order to oust its competitors out of the market.

The ‘Internet Service Providers Association of Pakistan’ (ISPAK)<sup>49</sup> is a non-profit organization comprising of the ISPs of Pakistan. ISPAK was formed in 1997 to act as a platform from which the service providers could deal with the regulator. ISPAK argues that PTCL is taking its first mover advantage in the internet and fixed telephony business, since they own the basic infrastructure; thus it often remains reluctant in signing the interconnection agreements with other competing ISPs. There is a common perception that the incumbent’s refusal or delay in the provision of interconnection facilities on fair terms essentially remains a major concern for all ISPs. ISPAK mentioned a fact that ISPs principally wanted the interconnection agreements should have been signed for a longer period of 10-15 years in order to develop more certain business models.

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<sup>49</sup> <http://www.ispak.com.pk/> (Accessed on 18<sup>th</sup> November, 2010)

However, PTCL reduced it to 2 years arbitrarily, which made the ISPs highly conscious and uncertain about their future; since as a matter of fact after a couple of years, PTCL may potentially refuse to extend those interconnection agreements any further.

PTCL has been further accused for cross-subsidizing the relatively competitive internet market with the exclusive margins that it makes in the landline market due to its extensive control over the fixed line infrastructure. PTCL was also blamed for renting higher charges from the competitors for providing access to its infrastructure. It was disclosed<sup>50</sup> that a 155Mbps (STM1) international circuit (Pakistan to UK) did cost US\$ 76,000 per month back in the year 2006; whereas that time a domestic circuit of the same capacity between Karachi and Islamabad was charged by PTCL at a price US\$ 123,500. It was discussed that such an unfair charging actually made PTCL capable of providing the broadband services at much competitive prices than of its competitors. On this issue ISPAK takes the stand that the current depleting margins of the ISPs in result of these excessively charged interconnection agreements rules out the possibility for them to invest any further on building their own infrastructure for some time until the market demand substantially increases for these services. Hence, it has been suspected that until the basic infrastructure is made available on competitive terms by alternative suppliers to all the service providers, PTCL would likely to take advantage of its dominant position by extracting maximum rents under the regulatory protection.

However, the sector regulator (PTA) refuses these allegations, and also does not accept the general impression among the operators that PTA keeps a softer hand upon PTCL or deliberately favors the incumbent in order to protect its strategic interests. Nevertheless, it admits that the regulator has to be careful when dealing with the incumbent's cases keeping in mind its market position and the relative significance. Similarly, competition commission (CCP) also acknowledges the fact that it faces certain limitations; especially when conducting an independent hearing of the cases relevant to the incumbent's unfair or anti-competitive practices, under the protection of 'legal monopoly'.

### *The Fixed Incumbent's (PTCL) Standpoint on the Issue*

Responding to the competitors complaints and grievances about the regulator's relatively softer corner and a supporting attitude towards protecting the incumbent's interests, such as in case of APC issue and IP telephony; PTCL refutes those allegations and prefers that the case should have been judged independently by a third party, may be a group of unbiased researchers or consultants in order to unearth the facts without being partisan or besieged with some preconceived notions. PTCL further explains that it never took stance against the introduction of IP telephony. However, PTCL has a clear stance on the issue saying that "only the voice operators should be allowed to provide VoIP services as they own LL or LDI licenses which are technology-neutral in essence, but the data operators should not be allowed to become a voice-carrier using VoIP technology since they own CVAS license, which doesn't allow them to provide VoIP services using their data networks.

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<sup>50</sup> <http://wiredpakistan.com/2006/06/interview-with-ispak-and-cybernet/> (Accessed on 17<sup>th</sup> January, 2011)

STM stands for 'Synchronous Transport Module'

Responding to the question that why not PTCL as an incumbent takes lead itself in introducing IP telephony services, following the global trend that voice is moving towards IP network; PTCL comments that they don't consider yet any need for that transition, since the rates of voice communication using PSTN network are already very cheap. PTCL contests the general impression that the prices of fixed line services are higher, and there is any need for the rates to be further reduced. Hence, from that perspective it rebuts any need for adopting the IP telephony in order to provide even cheaper voice services. However, commenting on the cost free VoIP-based video telephony services such as Skype, Yahoo and MSN, the incumbent argues that "how many people in Pakistan would currently be capable of using such services through internet access?"

On the APC issue, PTCL doesn't consider the currently charged APC rates too high as commonly portrayed by its cellular and broadband counterparts. The incumbent argues that the conditions for the Indian fixed incumbent BSNL (Bharat Sanchar Nigam Ltd.) are much more favorable than PTCL, since in India even mobile to mobile calls are also charged for ADC (Access Deficit Charges), in addition to the fact that there both the incoming and outgoing international calls are charged for ADC. It has been explained that during the deregulation process, APC was given preference over the ADC regime, but APC is relatively much less compensating in terms of revenue from the incumbent's perspective. The reason is because APC only charges the international incoming calls terminating in fixed line networks, whereas the ADC regime charges for both the international incoming calls and outgoing calls; and in addition to that it also charges the whole country traffic volume that may be around 10 times more than APC traffic volume, since it includes both the local & international calls.

Comparing to the technologically advanced part of the world, PTCL responds that "the modern world e.g. the Scandinavian countries already have a well-established installed capacity of more than 80% landline connections to connect the individual households; hence their fixed incumbents get enough money in terms of monthly line rents to be financially capable of providing the free or very low cost VoIP services as a replacement of already diminishing PSTN and ISDN lines<sup>51</sup>. But in context of Pakistan, the teledensity for the fixed line is only 3% and if PTCL charges only Rs. 175 (about 2\$) monthly line rent per connection, then how come one can expect that even the costs for delivering the basic services and the costs of network maintenance particularly in case of the copper lines could be compensated with that relatively very small revenue; keeping aside the other fixed and overhead costs."

PTCL asks those broadband competitors who are accusing PTCL for not supporting IP telephony proposal that "why not do they provide themselves the IP telephony services to their own customers, when they already have acquired the LL and LDI licenses in addition to having the CVAS license for their data operations?" PTCL further accuses that "those operators are probably already using their broadband networks for the international voice trafficking, and now they want

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<sup>51</sup> ISDN stands for 'Integrated Services Digital Network', which is basically a circuit switched technology capable of simultaneous digital transmission of data, voice and video over the dedicated lines between the communicating nodes using PSTN network in order to support a maximum data rate up to 64-128 kbps.

their share in the local traffic as well without having spent any money in laying down their own cables for the local loop operations.” The incumbent asks those operators who accuse PTCL for having monopoly over the local loop by saying that “out of the 30 million expected or estimated households in Pakistan; there are currently only 3.5 million connections made available through PTCL and still 26.5 million expected household connections are yet remained to be served; so why not those arguing operators take the initiative themselves in this regard? If those operators cannot do that for the economic reasons then why do they expect that PTCL would be earning enormous money out of just 3.5 million lines to carry out this task; or to accept losing its core business of local voice traffic so easily? If those operators consider so much business potential is there in the local loop voice-carrier operations; then why not do they invest themselves in building landline networks in order to serve the rest of more than 90% of the countrywide households?” PTCL further argues that “it is simply because the accusing operators want to do an easy job of passing blames on to PTCL; and hence getting rid of their own responsibilities. They actually want ‘cherry picking’ on the other’s investments. It’s very natural that they are pushing us, but of course we have to protect our own investments, revenues and strategic interests.”

Shedding light on the cost structure of fixed line services, the incumbent explains that fixed line network up-gradation and expansion requires huge upfront annual cost of around \$400-450 per copper paired last mile local loop that essentially connect an individual household, as estimated for the period during late 1990s. Moreover, it costs in addition around Rs. 900 (\$14/15) per month in average (i.e. annually around \$150-200 as per the currency rate of late 1990s) for the line maintenance and reparation work of each line. After more than a decade from this last estimated costing, both the material and labor costs are expected to have surged to a higher scale now. Remember that this estimated cost only reflects the ‘line specific costs’ which do not include the overhead costs, taxes, interests, and other running costs. In the local context, knowing the restricted ARPU per line; it is estimated that it might possibly take a decade or so before the operator may even reach to its ‘break-even’ point, especially if the deployments were made in the rural areas. The telecom vendor also agree on the fact that the ‘out-side plant’ is a very expensive proposition because laying underground cables and masts requires RoW which needs the engagement and permission of different authorities. Furthermore, fixed incumbent explains that the prices for fixed line services cannot be arbitrarily raised to increase the declining ARPU due to having faced with an intense competitive pressure from mobile services, which already have taken most of the voice market share from the fixed line (both in case of local/nationwide, and international traffic). In the presence of very high CAPEX and OPEX at one hand; whereas a continuously declining demand for the landline service on the other hand; it does not present any viable business case for a fixed line operator to commit investments in the deployment of copper lines any further. That explains one major reason to know why the fixed line (landline in this case) business is significantly lacking both the local and foreign investments.

It has been reported that the incurred costs of landline business actually exceeds the revenue of landline operators if they were only serving the residential customers due to their relatively very low spending (ARPU) and purchasing power as compared to the business customers. The classical

example of 20-80 is again applicable in this particular case, since the 20% of corporate users are generating more revenues than rest of 80% residential customers. The fixed incumbent (PTCL) further explains that “looking in the above context, actually those 20% corporate customers help rescuing the fixed line business, since the public institutions are already being served by another separate government owned telecom division called NTC (National Telecom Corporation). Therefore, it is primarily the government which is supposed to have the financial capacity to build countrywide fixed line infrastructure under its ‘social obligations’ to bear those uneconomical costs.” However, the author here presumes that considering the fixed line sector essentially an economic burden or an unproductive legacy actually didn’t let this sector grow under the competitive market conditions.

#### **7.4 Market Consolidation – Mergers & Acquisitions**

The market consolidation through expected mergers and acquisitions (M&A) particularly within the cellular and broadband industry has been considered a relevant topic in the regulatory context to be discussed largely from two different perspectives: first to see how these expected M&A or even the spread rumors do have impacts on the consumers’ mindset, and thus on the respective market shares of different operators; and secondly to observe that how these expected M&A and the resulting market consolidation would likely affect the current status of market competition and composition. This is a highly relevant issue particularly from the competition perspective, in order to foresee the potential impacts of these expected M&A on the market competition.

The operators assume that due to currently experienced a declining ARPU, increasing OPEX and depleting profit margins in result of a cut-throat price competition and other macro-economic factors; there are clear signs for further market consolidations. The cellular operators argue that the excessively charged licensing fee (for acquiring 2G licenses and expectedly in case of the 3G licensing as well) further makes it harder for these operators to sustain their existence in this highly cost-escalating and profit-squeezing competitive market. There is a general impression in the market that there will be only three 3G licenses issued most likely among the existing five contending cellular operators; hence the two possible mergers or acquisitions are expected in the near future. Looking at the current market shares of the existing cellular operators in this highly competitive oligopolistic market and the financial strength of their backing investors; it is obvious to conclude that these expected M&A may dramatically change the current competitive balance of the cellular market; hence every expected M&A deal would likely be under the strict observation of the competition authority (CCP).

There are many rumors going on in the media and market about the possible M&A between different head-to-head competing operators, but often it seems like most of these spread news are nothing more than gossips or part of a propaganda campaign; since frequently these news are later refuted by the referred operators. However these spread rumors and the propaganda campaigns do create enough sensation and uncertainty in the market to produce an obvious effect on the value of different telecom shares in the stock market. Sometimes such news is suspected to have been deliberately spread by one operator in order to grab the customers of other fiercely competing

operators, by creating the image for itself as ‘the next big thing’. It is noticed that almost every cellular operator has been named in the media reports and market gossips to be soon acquired by the other rival operator. However, both the telecom operators and regulator acknowledge the fact that such expected developments in telecom market are likely to occur in the projected future scenario.

Since almost all the current telecom operators in Pakistan are financially backed by the foreign investors, so the author assesses here that the expected M&A won’t just depend on the internal market dynamics; but that would also increasingly depend on the unfolding political events and the financially changing market conditions at an international scale, thus the resulting impacts of those global events and developments on their backing foreign investors. An interesting development in this regard reflects that the financially strong investment groups are now buying the whole business portfolio (assets and operations across the world) of another large investment groups through signing multibillion dollar deals. One such example<sup>52</sup> is the recent acquisition (though still in progress) made by the Norwegian-Russian telecom giant ‘Vimpelcom’ of another Egyptian based telecom giant ‘Orascom’ (along with an Italian operator ‘Wind’) in \$6.6B. As per this possible deal, Vimpelcom will own 100% shares of the Italian operator and 51.7% majority shares of Orascom. It is interesting to see the potential effects of this possible deal in light of the emerging bigger picture within the context of local telecom market.

The international operator ‘Telenor’ (Norway) which owns 100% shares of its subsidiary Telenor (Pakistan) actually holds 36% shares in Vimpelcom as well, whereas the rest of the shares in Vimpelcom belong to other stakeholders including the major Russian shareholder ‘Alfa Group’. Now the interesting point to note is that Orascom fully owns its subsidiary in Pakistan ‘Mobilink’ which is the mobile incumbent in Pakistan with above 33 million subscribers (est. June 2011); followed by Telenor (Pakistan) which is the second largest operator (with around 27 million subscriptions). Now if the above mentioned acquisition takes place, then the competitive scenario of the cellular market may completely change here. In result of this international acquisition (if it occurs), the local cellular market will be then likely dominated by Telenor (Pakistan) under the umbrella of Vimpelcom as Telenor would then hold above 55% shares of the local cellular market (after adding the current market shares of Orascom’s subsidiary Mobilink and Telenor). Another interesting point in this context would be then to observe the competition commission’s stance on this expected development, since its ruling and authority to stop any anticompetitive M&A is only applicable under the national regulatory framework and it doesn’t have any capacity to stop such deals happening at an international scale. Even though Telenor (Norway) as an investment group may still keep the structural and accounting separations between the operations of the two leading mobile operators in order to comply with the national regulatory framework; however, this deal (if it takes place and Telenor doesn’t dilute its shares in Vimpelcom) may significantly change the competitive landscape and market balance of the local cellular market.

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<sup>52</sup> <http://en.rian.ru/business/20101005/160837252.html> (Accessed on December 15th, 2010)

<http://www.reuters.com/article/2011/03/01/orascomtelecom-vimpelcom-idUSWEB249220110301> (Accessed on August 17th 2011)

Hence in result of that expected deal within the larger picture, the telecom sector would then be essentially controlled by three major consolidating investment groups with following stakes within the local telecom market.

#### The Norwegian/Russian/Egyptian investment group

- The Mobile incumbent 'Mobilink' with above 33 million cellular subscribers
- The second largest cellular operator of Pakistan 'Telenor' with 27 million subscribers
- The Mobilink's subsidiary 'Link Direct' which is a WiMAX operator and LDI carrier
- Major shares in a large international carrier Trans-World Associates (TWA), which is Orascom's subsidiary and provides international submarine fiber connectivity to Pakistan

#### The UAE based investment groups

- The fixed and broadband incumbent PTCL and the third large cellular operator 'Ufone' which is owned by 'Etisalat'
- The Fourth large cellular operator 'Warid'; and the second largest broadband operator and major LDI operator 'Wateen' which is owned by the 'Abu-Dhabi Group'
- The Qatar telecom 'Qtel' and 'Oman telecom 'Omantel' which own respectively the broadband operator 'WiTribe'; and third largest WLL and broadband operator 'WorldCall'

#### The Chinese investment groups

- The fast growing cellular operator 'Zong' a full subsidiary of 'China Mobile'
- The other Chinese telecom vendors such as 'Huawei' and 'ZTE' which have extensively established base within the local telecom vendor market

Hence, it is obvious to see how these mergers and acquisitions at an international scale between the large multinational groups would have effects on the business operations and market dynamics of the local telecom market. The above discussions and presented facts clearly indicate towards an increased integration and connectedness between the local and international markets both in terms of committed investments and market consolidation; and thus the resulting impacts on competition.

## **7.5 Cut-Throat Price Competition and the Declining ARPU & Net-Profits**

The operators argue that the increasing competition particularly in the cellular market served well to bring the prices dramatically down in order to meet one of the social objectives (i.e. making the prices affordable); however it has apparently failed to address the economic objective of the competition policy that assures a reasonable return on investments in order to keep the investors convinced to stay in the business. The operators argue that the issue of an unhealthy and cut-throat price competition has been debated in past with the regulator, but the regulator seems quite convinced to let the prices be settled down by the market forces themselves under the competitive market pressure without any need for the regulatory interventions by means of adopting an effective regulatory practice of 'price capping'.



It has been told that the ongoing cut-throat price competition has brought the ARPU (average return per user) at a scale, which is called among the lowest in the world (around \$2 monthly for a mobile user); leaving apparently not much charm for the foreign investors to further expand their networks and operations across the country, and rather they seem to be more convinced to consolidate their existing operations in order to secure their already committed investments. Hence, as per the BCG's Growth-Share Matrix<sup>53</sup>, it seems like the current status of the mobile sector in Pakistan has already moved from the second quadrant of the rapid growth (i.e. 'star' that refers to an increased scale of investments due to high returns on investments) towards the third quadrant of 'cash cows' (referring to a saturated market, resulting in a stable or rather decreasing profits). Hence, the dominant strategy for the current cellular operators would be to consolidate their already committed investments and harvesting maximum profits; instead of committing any further investments on business expansion. The author further presumes that until new positive developments have occurred on the technological, market, policy or regulatory fronts that open up new avenues of lucrative investments and relevant business opportunities; it is expected that the current stagnancy in telecom investments may lead the cellular market further towards the fourth quadrant of 'dogs'. At that stage the investors would start divesting their investments; and thus the market would move towards an increased consolidation in result of the expected mergers and acquisitions.

<b>Telecom Investment (US \$ million)</b>					
	<b>Cellular</b>	<b>LDI</b>	<b>LL</b>	<b>WLL</b>	<b>Total</b>
2003-04	666.1	6.4	-	162.7	<b>835.2</b>
2004-05	1,158.10	35.1	2.3	277.3	<b>1,472.80</b>
2005-06	1,420.90	50.5	0.3	259.4	<b>1,731.10</b>
2006-07	2,584.50	602.8	40.6	747	<b>3,974.80</b>
2007-08	2,337.70	403.9	342.1	52.8	<b>3,136.40</b>
2008-09	1,229.75	276.75	57.37	82.11	<b>1,646.98</b>
2009-10	908.8	183.1	22.5	23	<b>1,137.4</b>

Table 9: Telecom Investment

Source: [www.pta.gov.pk](http://www.pta.gov.pk)

<b>Telecom Revenues (Rs. Millions)</b>						
	<b>Cellular</b>	<b>Local Loop</b>	<b>LDI</b>	<b>WLL</b>	<b>VAS (est.)</b>	<b>Total</b>
<b>2003-04</b>	27,840	76,444	1,336	1,152	10,056	116,827
<b>2004-05</b>	48,880	78,828	3,672	275	12,570	144,226
<b>2005-06</b>	89,896	71,186	7,199	12,453	13,827	194,562
<b>2006-07</b>	133,132	68,368	15,567	2,645	15,901	235,613
<b>2007-08</b>	182,122	63,693	21,983	2,703	8,048	278,509
<b>2008-09</b>	212,423	62,568	47,969	2,670	8,179	333,882
<b>2009-10</b>	236,047	61,464	47,067	2,880	10,202	357,712

Table 10: Telecom Revenues

Source: [www.pta.gov.pk](http://www.pta.gov.pk)

<sup>53</sup> BCG stands for 'Boston Consulting Group' – a well-known consulting company whose 'growth-share matrix' has been frequently referred in the market's strategic analysis

The statistics presented in table 9 highlight the increased investments over the years 2005-08 when the telecom reform initiatives actually took effect; and then it follows a sharp decline in telecom investments over the past two years, ever since the change of government back in the year 2008. Hence, the drastic change in the investors' confidence on the telecom market in result of the change within the political regime clearly reflects the 'policy impacts on the scale of investments'. The table 10 highlights interesting patterns, where the revenues of the telecom sector is shown to be growing steadily within the cellular and LDI markets; however an expected gradual decline in LL market; whereas a certain degree of uncertainty within the revenues of the WLL and VAS markets. It's interesting to see a drastic surge in WLL market revenue only during the year 2005/06 followed by a sharp decline the very next year, but then a clear sign of market stagnancy over the last four years. Similarly in case of VAS services, the revenues were increased to a record high level during the year 2006-07 and then immediately a sharp decline the very next year, followed by a steady growth. It would be interesting to unfold those major events, which actually stimulated or caused for the observed patterns of changes within the WLL & VAS markets during the years 2005-08.

However, the broader picture reflects the fact that collectively the revenues of the telecom sector have shown a steady growth ever since the year 2003-04 in result of the adopted policy and regulatory reforms. But on the other hand, what is the alarming factor is the outcry of market players for their diminishing returns and depleting margins to a level where their annual reports during the past few years actually show negative profits, apart from a couple of operators. The operators were found primarily upset for the declining ARPU, since despite the phenomenal growth in terms of the number of subscribers in the cellular market, and a moderate growth in WLL and broadband markets; the consumers' monthly spending actually didn't grow with the same pace. In result of that, the costs of operations and service maintenance have more drastically increased than of the return on their investments in terms of revenues from the subscribed users. In addition to that, as a matter of fact the revenues are now increasingly split among the excessive number of licensees (operators) as they all fiercely fight for their individual shares out of the total generated revenues.

The operators further argue that the excessive licensing policy has had negative impacts on the industry both in terms of depleting profit margins but also in terms of the duplication of multiple competing networks, as apparently serving the same purpose. The author considers that this unnecessary duplication of networks; and in result the waste of resources and environmental losses actually reflect the absence of an effective 'infrastructure-sharing' regime, which is required to be properly facilitated by the regulator. On the other hand, the regulator should convince and facilitate the investors to serve those telecom markets which are still considered un-served (or under-served), and thus it should also highlight those potential areas and applications where an effective use of telecommunication networks and associated resources would likely create new business opportunities (i.e. suggesting the 'blue-oceans'); hence bringing fresh streams of revenues for an increased profit margin through creating a 'win-win situation' for all stakeholders. In the absence of that desired proactive and facilitating role of the regulator, the excessive licensing merely resulted in creating a battlefield for a 'cut-throat price competition' among the rival operators fighting for

their respective shares in the existing markets (i.e. the ‘red oceans’); hence ending up in a ‘lose-lose’ situation, despite having experienced a tremendous market growth.

In order to counter the decreasing ARPU, and hence the reduced margins due to an ongoing price war among the rival firms, the telecom operators are now finding new ‘niche’ markets even outside the telecom sector. For example, some operators were found enthusiastic in getting entry into energy sector due to observing the current energy crisis in Pakistan. On ‘pricing strategy’, the cellular operators seem to be focused on making optimal use of their network capacities, even if they had to offer extremely cheap packages such as talking for free after 2 minutes of call or offering thousands of SMS at very nominal rates; knowing the fact that most of the users do not talk more than 2 minutes and neither do they have time to send more than 5-10 text messages on average a day. However, the fixed incumbent has apparently not learned yet the valuable lesson from their cellular counterparts in terms of optimally utilizing their already installed country-wide deployments (e.g. the copper networks) by offering similar sort of enticing packages.

As a matter of fact most of the youngsters are fond of voice calling and text messaging; hence it is also part of the customers’ acquisition and retention strategy to offer cheaper services, as knowing the high ‘price elasticity’ element in different segments of the user groups. As far the cost factor is concerned, the operators disclose the fact that the OPEX doesn’t get affected much with the increased traffic, since once the major fixed cost elements of the network installations (i.e. the installation of towers and switches including the BTS, BSC, and MSC)<sup>54</sup> are endured, then the differential volume of the carrying traffic doesn’t make any significant difference in terms of operational or carrier costs. It has been further told that the Pakistani customers are generally keener to get cheaper minutes and free packages (‘gift economy’) than paying additional for the use of value-added services (VAS) and other innovative features. MoIT accepts the operators’ concerns over the fact that the market has been left too crowded with an excessive licensing. However, MoIT argues that it has always tried to facilitate the telecom market to introduce value-added services (VAS) in order to make innovation-led VAS as a benchmark and a new base for future competition; instead of engaging in an intensive ‘price-war’. It has been also called helpful for the operators to increase their currently declining ARPU; but MoIT leaves it up to the operators’ discretion to choose what ground they want to select for competition.

The Telco’s diminishing profits due to the increased costs and reduced ARPU has also been attributed to the unprecedented scale of rising inflation in the country, which has also severely affected the buyers’ purchasing power; hence facing the reduced ARPU due to their budget constraints, as assessed by the author. Moreover, the increasing inflation also forces the operators to make periodical increments in the wages of both their labor and professional employees in order to keep their business running. The cellular operators also reveal that the cellular market at the moment doesn’t shows any significant sign of ‘market elasticity’; thus even the further reduction in prices doesn’t help in substantially increasing the customer base (which is also a sign of market

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<sup>54</sup> BTS, BSC, and MSC stand for Base Transceiver Station; Base Station Controller; and Mobile Switching Center respectively

saturation). Hence, the cellular operators are logically convinced that probably they may not be able to compensate their current losses through achieving demand-side 'economies of scale' by merely reducing the prices any further, as being part of the ongoing price competition.

In addition to that, the increased dollar parity with respect to Rupees has also been considered a reason for the reduced profits; since the revenue is counted in Rupees, but the dividends (returns on investments) are paid in dollars. Just during a decade ago when the worth of Indian and Pakistani rupees was almost equal, and 1 US dollar was that time equivalent to around 65 Rupees; but now the equation has been dramatically changed since the Indian Rupee has got almost double in value as compared to Pakistani Rupee. However, today 1 US Dollar is worth RS. 85 (Pakistani); whereas in comparison it only pays half i.e. Rs. 44 (Indian). Hence due to the increasing 'price inflation' and the 'currency devaluation', the local telecom sector is gradually losing its charm from the investment perspective; especially in the presence of encountering other macro-economic issues as well. The author further assumes here that the current situation would likely remain grave or even may get worse, if serious, committed and prudent steps were not taken swiftly through implementing a broader scale agenda for the economic, policy, regulatory and market reforms.

## **7.6 Accounting and Structural Separation**

Historically, the structural and accounting separation has been considered an effective regulatory tool in order to introduce competition within the market, through reducing the scale of anticompetitive market control of the dominant players, particularly in case of the incumbent. This regulatory tool has been observed being successfully implemented in the exemplary case of AT&T divestiture back in 1984; when the US fixed incumbent was split into multiple Regional Bell Operating Companies, commonly abbreviated as RBOCs. These regulatory separations essentially intend to restrict the incumbent's control over the essential facilities and to discourage its presence in different parts of the vertical chain. An effective separation helps discouraging the engagement of the parental company in anti-competitively cross-subsidizing one of its relatively weaker SBU (Strategic Business Unit) or a 'Subsidiary' that face stiff competition with the help of additional margins made by its other dominant SBUs (or subsidiaries) due to facing much lesser competition over there; hence, thus resulting in a control over the different parts of the value chain.

Similarly, in case of AT&T, the incumbent was forced to divest (spin-off) its local exchange service operating companies; in result the LL and LDI businesses were both structurally and accounting-wise separated from each other. The case has been frequently referred in the regulatory literature as a success story which definitely had a tremendous impact over the rapid growth of competition in the US telecom markets; however, this particular case also set a benchmark for rest of the world to learn from this successful experience in order to introduce similar sorts of reform initiatives within their own regulatory frameworks, and thus to make their respective markets more competitive. However, a prudent and conscious use of this regulatory tool has also been advised; since the enforced scale of separation has to match with the level of breach (i.e. the anticompetitive infringement) that has occurred by an incumbent or other dominant player.

Some large operators inform that within their own corporate accounting system, the ‘accounting separation’ concept has already been emplaced, since the different SBUs within the organization’s overall business portfolio are required to submit their quarterly and annual reports independently; hence they are also evaluated separately to judge their relative performances. So they assume less risk of cross subsidizing the profit margins across the units, considering the fact the different SBUs have been found internally in competition, as struggling to grow their own businesses; instead of splitting their revenues and profits by supporting the other SBUs. However, the author presumes that when it would come to secure the business interests of the parental company and the backing investors, then the different sister companies (subsidiaries) and SBUs within the ownership of the same investment group would make the decisions to first protect the group’s interest; even if they had to cross-subsidize between different business units. In this case the risk of a possible ‘conflict of interest’ may exist at an executive level between these business units, due to the differential possibilities of growth and financial incentives for each individual business unit. Hence, from the operators’ perspective it is often hard to clearly demarcate the boundaries and differentiate between the intra-organizational strategic investments and anticompetitive cross-subsidizing. Similarly, it will also be challenging for the regulatory authority to correctly measure the amount of breach; and thus deciding the scale of regulatory treatment accordingly, in order to effectively address the faced challenges. However, the case of ‘structural separation’ is generally considered as too high in terms of ‘dosage’ for the ‘regulatory remedy’ to be suggested in an ordinary situation; hence it is not wise ‘killing a mouse with a gun’.

Whether the Pakistani telecom market does present that grave situation, which may potentially demand for such a large scale regulatory remedy; the issue is quite debatable however. Thus the issue was raised in front of different relevant stakeholders in order to get their points of view and respective opinions on it. The competing operators particularly the broadband operators were more vocal to speak in favor of an immediate enactment of such separations, since they do consider the current state of competition within the fixed line and broadband market as immensely grave; and hence they demand for an immediate and wide scale regulatory treatment in order to establish the desired competition in those markets. They have had strong grievances against PTCL saying that the incumbent deliberately doesn’t facilitate its competitors in accessing the infrastructure at reasonable terms and conditions in order to create barriers for its competitors. It has been further argued that in such a grave situation, the other operators have been left with marginal scope in making business; due to the strong hold of the incumbent over the infrastructure and ‘essential facilities’. However, there has been a common realization of the fact that in the current stage of market development; an effective implementation of the ‘accounting separation’ seems a more viable option, than going for a complete ‘structural divestiture’ due to possibly encountering legal issues, particularly in wake of the incumbent’s privatization. MoIT has also principally agreed upon the basic rationale and the need for an effective adaptation of this practice in Pakistan; and hence it promises to consider the issue in its next revision of the APC policy. It has been further ensured that the accounting separation between the LDI and LL operations would also be introduced in all those cases, where the single operator would own both licenses.

However, the incumbent PTCL has had quite a different stance on that issue, as expected. The fixed incumbent argues that the ‘accounting separation regulation’ has already been enforced in Pakistan and it is now effectively working. The incumbent explains that there are standard interconnection agreements emplaced; where the rates are already fixed; hence the incumbent cannot charge anything extra for the unused capacity. It is however unnecessary to consider that any further enforcement of the structural separation in case of PTCL would do anything marvelous in terms of improving competition within the fixed line or broadband markets; since all sort of licenses including the LDI and LL licenses have already been issued to the competitors as well, as further argued by the incumbent. PTCL argues that “even in US they are now moving back towards an increased integration from the previously adopted separation model after experiencing the divestiture model for more than 26 years; and now the LDI operators are again merging with the RBOCs since the market conditions are not feasible otherwise.” The incumbent further comments “it is not wise to directly compare our regulatory, technological and market conditions and thus the evolution patterns with the developmental trajectories as have been observed and experienced in the western world. It is because, the developed countries have been evolving and experiencing all those practices for now more than 200 years; but on the other hand, their matured technologies and markets have been thrown upon us while we were not yet passed through all that gradual and evolutionary learning experience. Hence, instead of blindly following their practices, we have to develop our own ‘catch up strategies’ within our own local context.”

## **7.7 The Interconnection Agreements**

Interconnection has been generally considered in the literature (Melody, 1997; Intven, 2000) as a ‘cornerstone of competition’; thus often it also becomes the ‘bone of contention’ between the competing operators. The presence of a fair and effective interconnection regime has a fundamental importance in the smooth running of telecom business; both from the competition perspective, but also due to the fact that it assures that the separate telecom networks owned by different competing operators should all function like a ‘single system’, when delivering end-to-end services to the consumers with ‘seamless connectivity’. Hence, in a well-functioning interconnection regime, the users are not concerned with or even aware of the underlying transport technologies that have been deployed for establishing the end-to-end connectivity between the primary supplier and end-user.

Melody (1997) has highlighted a list of issues (see table 11), which are deemed to be relevant with the interconnection debates, as classified within four different domains namely: technical, service, competitive and regulated domains. He insists on the direct regulatory involvement in order to effectively incorporate those issues into interconnection negotiations, which bear on the broader social and economic objectives. However, the observation and discussions highlight the fact that in most of the cases, these are primarily the issues associated with the competitive and regulated domains, which actually become contentious among the competing operators, incumbent and regulator. It is because the issues related to technical and service domains are relatively easier to be resolved with mutual collaborative efforts if the ‘will’ is there; however building such a consensus among the contenders within the competitive and regulated domains often becomes a challenging

task. It is because in later cases, the vested interests and financial stakes of the engaged parties are increasingly involved that demands the involvement of a fair, proactive and independent regulator.

<b>Technical</b>
Standard setting; technical compatibility; signal quality; Open Network Provisioning (ONP)/Open Network Architecture (ONA)
<b>Service</b>
Co-operative network expansion; compatible practices; uniform service definitions and conditions; shared responsibilities, costs, and revenues
<b>Competitive</b>
Terms of access to and use of essential facilities; negotiated locations; service levels, capacities, quality; negotiated prices and risks; supplemental services for the second carrier
<b>Regulated</b>
Criteria for determining equal access; assessment of reasonable costs and prices; incorporation of USO and industrial policy objectives; establishing a process for ongoing problem resolution

Table 11: Interconnection Issues

Source: Melody (1997, pp. 57)

As per the Clause 13 of the Pakistan Telecommunication Rules (2000), the incumbent PTCL is required to enter into an interconnection agreement within ninety (90) days from the date the request has been made by another operator. In order to facilitate the efficient conclusion of such an interconnection agreement on fair and reasonable terms, and in conformity with the Telecom Deregulation Policy (2003) and PTA's Interconnection Guidelines (2004); PTCL is obliged to follow the 'Reference Interconnection Offer' (RIO) in order to fulfill its obligations as a significant market power (SMP). This document has been mutually prepared and approved by the market players and regulator under the supervision of foreign expert groups. The document was aimed at promoting a telecom market that is composed of multiple operators and multiple services in order to encourage competition in the telecom sector and to also pave the path for a gradual transition from the monopolistic market structure towards a competitive market. It was acknowledged by the operators that the crux of all the competition related debates in the delivery of telecom services actually revolves around the need for an effective and fair interconnection regime. It has been informed that RIO was basically designed to incorporate the internationally acknowledged best practices within the local context to facilitate the interconnection agreements between the competing operators. It has been called a transparent procedure; hence, leaving no capacity for setting discriminatory charges based on individual choices and preferences, as claimed by PTCL. Apparently the mobile operators also didn't have any major grievances against PTCL in this regard, since they considered the interconnection process relatively transparent, given the fact that the incumbent has to merely follow the due procedures and instructions as declared in the RIO document. PTCL further argues that interconnection is a standard procedure as it strictly follows RIO; thus the incumbent cannot change even an iota of it when making interconnection agreements with interested operators.



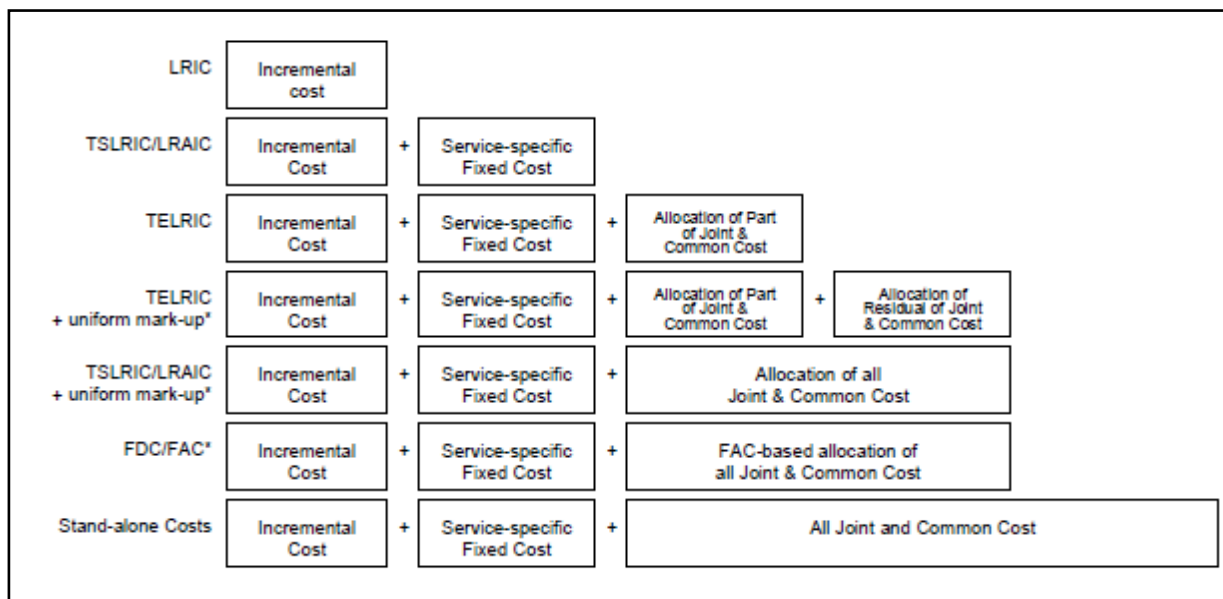


Fig. 17: The Relationship between Costs, Costing Methods and Allocations

Source: Intven (2000, p. B-14)

The figure 17 illustrates the different economic models that have been traditionally used for settling down the interconnection agreements. Each model has different underlying assumptions; hence their suitability for varying contexts also differs as per the specific requirements and historical evolution of different telecom markets. The interconnection regime in Pakistan primarily follows LRIC (Long-Run Incremental Cost) model for interconnection agreements. This is supposed to be the most basic and relatively an easier economic model to be implemented, since it only allows the incumbent to claim for the compensation of ‘incremental costs’ that occur in building infrastructure and access provision to un-served areas on account of APC. LRIC has been generally considered more tilted towards serving the ‘social objectives’ than producing financial incentives for the incumbent during the access provision; since in this model the incumbent is only supposed to receive the incremental cost and thus it cannot claim for any additional fixed, joint or common costs that may have incurred during its infrastructure or network expansion in serving those uneconomical rural areas. On the other hand, the US regulator FCC has adopted TELRIC (Total Element LRIC) model which is on the other extreme largely favors the incumbent’s interests through allowing it to claim for not only incremental but also for the ‘service-specific fixed costs’ and an allocated part of the ‘joint & common costs’ as well; sometimes also with the possibility of additional uniform ‘markup’ to recover the ‘residual costs’. TELRIC basically intends to encourage the investors for the ‘facility (or infrastructure)’ based competition’. However, the EU has adopted a mediocre path by following LRAIC (Long-Run Average Incremental Cost), which is also known as TSLRIC (Total Service LRIC) model that only allows the incumbent to claim for the ‘service-specific fixed costs’ in addition to the incremental cost. The above figure illustrates very well the different costing methods, which have been traditionally adopted within different interconnection regimes across the world.

Retrospectively, the current adopted LRIC model should have suited well the Pakistani context in order to promote the ‘services-based competition’ on the already deployed incumbent’s network through facilitating favorable conditions for interconnections to the competing operators. The deregulation policy bound PTA to periodically review (at least twice a year) the rationale of the adopted formula for the interconnection agreements in light of its suitability for the local context; and hence to accordingly engage with the market players to build a consensus on the issue. However, it seems like either there is a matter of ‘communication gap’ among the engaged parties or apparently an ‘element of inefficiency’ on behalf of the regulator in this regard, which results in a growing dissatisfaction among the operators. However, the author finds that the operators are relatively more satisfied with the ‘Interconnection Charges’ (IC) as per the RIO model; however they are extremely concerned about the adopted APC formula, and thus they demand for its regular revision. Hence, the topic critically requires further research on behalf of the regulator to exactly pinpoint the reasons for mounting dissatisfaction and grievances among the operators on this issue.

However, the large operators seem to be in favor of having the possibility and some capacity of individual bargaining with the incumbent based on the traffic volume, as generated by each individual operator; since such a ‘volume-based pricing’ is assumed to be more in favor of the large operators when compared with the ‘cost-based pricing’ on standard terms. The operators also highlight another important issue that signing an interconnection agreement with PTCL involves quite cumbersome and high scale of bureaucratic procedures, which pose unnecessary delays in commencing operations. They comment that due to those bureaucratic hurdles, the incumbent is losing significant business to their new competitors which have recently emerged within the leasing of backhaul fiber connectivity. Under facing an increased competitive pressure in this emerging facility-based competition, the incumbent is also forced to bring its prices down in order to remain in the competition as a ‘long distance carrier’. However, as far the local loop business is concerned; PTCL still fully enjoys its control over the local loops and its dominant position as a ‘local loop carrier’, due to the absence of any competitive pressure in this particular market so far.

## **7.8 The Issues related to ASR and APC**

As discussed earlier in the previous chapter; however the current rates for ASR and APC and the formula used for the split of revenues have been again briefly highlighted here for the sake of readers’ convenience. The Approved Settlement Rate (ASR) is a fixed amount that has been charged from an international carrier for terminating the voice call to a local landline or a cellular number. Currently the ASR rate is fixed at 10.5 cents/minute (est. February 2011) for the incoming international calls. ASR is further then split up in two different sub-accounts; where 5 cents are paid to the LDI operator for carrying the call as long-distance carrier, whereas the rest 5.5 cents are paid to LL operators in those cases when the incoming call are terminated at the fixed line. The LL operator is assumed to use that amount for the expansion of fixed line network, building infrastructure and access promotion activities; hence this part of the ASR is given the name ‘Access Promotion Contribution’ (APC). In some regulatory regimes like in neighboring India, APC has been rather named as ADC (Access Deficient Charges) with a slightly different definition in terms of the split of revenue. On the other hand if the incoming international call are terminated at the

cellular networks, then the mobile operators are not entitled to receive any share out of it, since their costs of access provision are relatively much lower than of a fixed line operator, particularly in the rural areas; hence in that case the APC (5.5 cents/minute) is then deposited to the USF account for the purpose of serving the USO objectives and bridging the ‘digital divide’ through connecting the rural communities at subsidized rates. However, the mobile operators are entitled to receive a fixed ‘Mobile Termination Rate’ (MTR) from all the received calls terminating at their cellular numbers, which are generated inside the country from any operator.

The section 4.3 of ‘Deregulation Policy’ (2003) explains that “at present, net incoming international traffic generates a financial premium over the cost of conveying and terminating the traffic into Pakistan. Although historically this premium has been large, it has been steadily reducing, in-line with global trends. As long as the premium continues to exist, a reasonable portion of the premium is proposed to be used to promote infrastructure expansion. The portion of the premium applied to promoting infrastructure expansion is referred to as the Access Promotion Contribution (APC).” The document further explains that APC would be derived based on the LRIC formula; moreover that the APC formula would be reviewed and notified at least once every six months. The document also ensures that symmetry between the incoming and outgoing international termination rates between the carriers would be maintained.

Now let’s briefly review the comparable ADC regime in India in order to investigate some of the facts. The Indian National Telecom Policy (1999) aims everyone to have access to telephony even in the rural areas. The Indian fixed incumbent (BSNL) and the other fixed line operators are called to be active in serving rural areas. However, due to the emergence of new private market players entering in the telecom market, the operators are now engaged in an intensive ‘price war’. This has in result affected the margins of both the private operators and BSNL. The document explains that previously the Indian incumbent used to operate also in the uneconomical rural areas by cross-subsidizing those operations with the additional profits generated from the local and long distance calls; however, under the competitive pressure and an on-going price-war, it has now become difficult to do so any longer. Hence, an Access Deficit Charge (ADC) has been levied upon the private competing operators in order to fill that deficit. The Indian National Telecom policy (1999) illustrates that “ADC is to be paid on both the incoming and outgoing international calls and also upon the calls originated from mobile/WLL (M).” However, as per the Press Release No. 3/2005, the Telecom Regulatory Authority of India (TRAI) has announced to lower the ADC charges.<sup>55</sup> In the meanwhile, it has been reported in media<sup>56</sup> that MoIT is also considering to revise the currently approved settlement rates (ASR) for the incoming international calls in response to the mounting pressure received from the operators asking for rationalizing these rates; in order to discourage the increasing trend towards ‘grey trafficking’ and to curb the subsequent losses to the national exchequer. However, so far there has not been heard any news about the government’s willingness

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<sup>55</sup> <http://www.opendb.net/element/2329.php> (Accessed on November 12th, 2010)

<sup>56</sup> <http://telecomnewspk.com/2010/05/government-decides-to-revise-telecom-approved-settlement-rates-asrs/> (Accessed on February 2, 2011)

to reasonably reduce the current rates; instead more talks are going on about settling down the issues with the current APC formula in order to make it acceptable for all the operators.

The currently charged ASR has been noticed among the highest in the region. When compared with the international termination rates in India, which is reportedly only \$0.008 per minute (est. 2009)<sup>57</sup>, the rates charged in Pakistan (i.e. 10.5 cents/minute) is astonishingly 1300 times higher than of the termination rates charged in India; that literally makes no sense at all. The international trend is increasingly towards lowering the ASR (as the above quoted 'deregulation policy' also affirms) in order to generate more traffic volume for incoming international calls in order to encourage the country's connectivity with rest of the world and to discourage the 'grey trafficking' that severely causes huge losses to the national economy. On the contrary; the telecom ministry seems to be following the opposite track by imposing sky-high international call termination rates. By doing so, the government and regulator themselves actually help encouraging the volume of grey trafficking in the country; since no international carrier is willing to pay this exorbitant call termination rates to the government for terminating their calls to the local numbers through following proper channels.

On the contrary, MoIT defends the currently high ASR on the incoming international calls on the basis that a large number of Pakistani expatriates living abroad have the paying capacity to undergo these additional charges as premium to contribute to their country. This argument is based on the belief that those expatriates would need any way to communicate with their families living in Pakistan at any cost what so ever; so government wants them to be charged as high as possible to benefit the national economy. MoIT argues that it is an international practice to get financially benefited from the higher earnings of their expatriates; hence the role of MoIT here only remains to set priorities for spending these collected revenues prudently like a custodian. However some respondents look at this issue quite differently, while considering the currently charged ASR as excessively high. They consider the above line of argument passed by MoIT as an unjust imposed levy on the expatriates. In addition to that, by doing so the government somehow also discourages the effective use of different communication means for the business purposes; e.g. many global marketing firms primarily run their businesses through extensively making use of telephone calls. However, due to the excessively high ASR, they bypass the proper channels to terminate their calls.

Another important point mentioned in the 'deregulation policy' about APC is that this amount (currently more than half of ASR) would dedicatedly be spent on the LL network expansion in uneconomical areas to connect the rural communities. However the statistics published by PTA (refer to table 9) portrays quite a different picture; illustrating that despite that significantly large portion of ASR received by the incumbent in terms of APC, the net investment on the infrastructure expansion in case of fixed local loops (LL) has been significantly reduced over the past couple of years. These statistics reveal that the scale of investments on the expansion and up-gradation of fixed local loop have been dramatically declined from \$342 M during the fiscal year 2007-08 to as low as \$22M in the year 2009-10. In addition to that, instead of having achieved an increased

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<sup>57</sup> <http://www.telecomasia.net/content/trai-raises-international-termination-rates-33-0> (Accessed on February 3, 2011)

number of landline subscribers, the landline subscriptions have also been noticed significantly decreased over the past few years. These figures clearly reflect that the incumbent has been apparently failed in achieving the purpose for which the APC has been provided to it. In light of these facts, the competing operators demand for the removal of APC altogether from the ASR equation or reducing it to a substantial level. However, in case of doing so; the question rises how the issue of the local loop network expansion and access provision in uneconomical areas would be then addressed? Responding to the issue, the operators speak in favor of increasing the portion of USF in the ASR equation since they relatively more trust on the performance of the USF Company. This issue has been further discussed in the next subsection 'RoW and infrastructure sharing'.

The current APC policy highlights that all the licensees are obliged to file reports on the volumes, sources and destinations of the international incoming minutes, and accordingly allow PTA to audit their Call Detail Records (CDR) and billing systems for the purpose of detecting and eliminating the fraud elements. Hence, this makes the LDI operators responsible for providing the real time, on-line traffic information to the regulator for the monitoring and mirroring of international traffic. In this regard, the regulator then needs to be more efficient and vigilant in adopting such mechanisms which could effectively monitor the operators' CDR; so that it could effectively detect any deficiencies and gaps between the actual and reported data as provided by the operators. Adopting such mechanism would also be helpful in curtailing the current scale of 'grey trafficking'.

Comparing here again with the ADC regime as adopted in India; the ADC is currently being charged there both from the incoming international calls and all the outgoing calls either generated from landline, or from mobile and WLL networks. On the other hand, in Pakistan the APC has been currently imposed only on the incoming international calls, probably because until back in some years' time, all the outgoing calls were being generated by the fixed incumbent's landline network itself; but ever since the drastic decline in the international call rates on mobile networks, now it has been reported that more than 80% of the outgoing international calls are generated through mobile networks. Hence during the past couple of years the whole scenario has been significantly changed, which also requires a review of the APC policy in light of these new developments.

The author proposes here a possible change within the APC policy that may help dealing with the currently an exorbitant and disproportionally high rates of ASR. The proposal is to significantly reduce the excessively high ASR on the incoming international calls by balancing the deficit of the equation with a reasonably charged ASR on the all outgoing international calls as well, which are generated from any operator no matter if it is a fixed, mobile or WLL operator. However, in the current financial status of the cellular operators with depleting profit margins, it is recommended to leave this proposal in pending for some time until the market gets stable. However, in the future context, once the current financial crisis is over, as VAS revenues are also expected to significantly grow over time to reasonably compensate the current losses in the voice business; there is a need to balance the disproportionally high amounts of ASR (and hence APC) by sensibly splitting the amount between the incoming and outgoing international calls. Furthermore, a large cellular operator has disclosed a fact that PTCL has now principally agreed with the mobile operators on

splitting a certain percentage of APC to be shared with the mobile operators for the expansion and up-gradation of their cellular networks in the rural areas.

However, the fixed incumbent PTCL argues here that “the conditions for the fixed incumbent (BSNL) in India are much more favorable than in case of PTCL in Pakistan, since in India even mobile to mobile calls are also charged for ADC, in addition to the fact that both the incoming and outgoing international calls are charged for ADC.” It has been told that “during the deregulation process, APC has been given preference over ADC, which is in fact relatively much less compensating from the incumbent’s perspective. It is because APC only charges the international traffic termination, whereas ADC does charge the whole country traffic volume that may be around 10 times more than the traffic volume that APC currently charges; since ADC includes all sort of traffic including both the local calls (origination/termination) and international incoming and outgoing calls.”

However, the broadband operators disagree with the incumbent’s given line of argument saying that “APC is meant to support the LL incumbent in its effort to promote access provision through compensating its losses in serving the uneconomical areas in order to bridge the digital divide. However, the recent statistics clearly reveals that instead of increasing the landline teledensity, it has been actually noticed as steadily declining over the past few years.” As a matter of fact, this is true that despite receiving a huge amount in terms of APC with given the tasks to promote access and increase the teledensity in the fixed line sector; the statistics show the opposite effects i.e. there has been a steady decline (of about 25% landline subscribers i.e. from 4.5 million in 2003/04 to now 3.4 million subscribers) ever since the APC was imposed during the sector deregulation back in the year 2003-04. They operators argue that in addition to that, the condition of the already deployed copper lines has also been reportedly deteriorating day by day, with an increasing number of line faults and experiencing a delayed response time; resulting in an increased customer’s dissatisfaction (as revealed by the surveys as well) due to the lack of maintenance and network up-gradation. Taking support of these arguments, the broadband operators conclude that the fixed incumbent has failed in achieving the results for which APC has been provided to it, ever since the current deregulation policy has been enforced in Pakistan. The LDI operators inform that using the above stated facts as point of departure, the LDI operators have now filed a case in the Lahore High-Court against the imposed excessively high APC on international carriers & LDI operators. They demand APC to be completely removed from the equation, since the actual context and the desired purpose of APC has been now practically lost. However, the cellular operators argue in favor of finding a right balance with respect to APC in order to serve both the social and economic objectives.

Finally, it is argued by some of the respondents that keeping in mind the current fragile status of US Dollar (USD) in the international market, and in result quite an imbalanced relationship between the Dollar and Rupee; it has been recommended that all the transactions and accountings (including IC, APC and ASR tariffs) should have been managed in a single currency, preferably within the local currency (Rupee). This has been considered important in order to avoid any confusion or uncertainty regarding inter-currency rate fluctuations, both in result of the local currency

devaluation and US dollar instability in international markets. It has been further argued that the trend of switching to the national currencies for all sorts of transactions is increasingly observed as a commonly adopted practice across the world, in order to get relatively more immune to the negative impacts of the fragile global economy; especially due to an uncertain and weakening status of USD with respect to other currencies. Moreover, if the consumer is being charged in Rupees, then APC should also be charged in Rupee to avoid the need for frequent price adjustments.

### **7.9 The Rights of Way (RoW) Issues & the Need for Infrastructure Sharing**

At the time when telecom facilities were being provided under the ‘natural monopoly’, the public telecom companies (PTTs) have had the exclusive rights to build their infrastructure on the government’s expense, with provided all the other associated facilities as well, in order to meet the ‘social objectives’ through providing the basic telecom services to general public as ‘obligation’. But ever since the markets were opened for competition & the private investments are increasingly involved in building infrastructure and delivering competitive telecom services to public ‘on economic terms’; the rights to access public locations and properties are not any more considered taken for granted as experienced in old times. It is now increasingly getting difficult to get permission and legal rights for building duplicative infrastructures or networks especially in the metropolitan cities; where the private operators are most interested to deliver telecom services due to expecting higher returns on their investments, instead of serving the distant rural communities. Hence in this changing scenario, the authorities who own these rights or are authorized to make best use of these rights in the public interest increasingly impose strict rules on accessing to these ‘rights of way’ for building infrastructure, probably both for the economic & environmental reasons.

In the literature, the ‘rights of way’ has been defined as “the legal rights of an operator to access streets, sidewalks, road allowances and other public property for the purpose of constructing, operating and maintaining facilities” (Melody, 1997). An extensive infrastructure is required to be built in order to roll out the telecommunications networks, which includes poles, ducts, conduits, trenches, manholes, street pedestals, and towers. There is a growing consciousness among the public to protect the environment (due to the reasons like public health/safety, convenience and aesthetics); hence they increasingly put pressure on the public authorities to take these issues into consideration. On the other hand, the public authorities also now consider the ‘rights of way’ as a scarce resource; thus they prefer the installed network facilities and built infrastructure which deliver similar services to be shared among the competing operators in order to avoid unnecessary duplication of networks and the waste of resources. However, so far the trend of selling these ‘rights of way’ using market mechanism like a ‘commercial commodity’ has been considered neither an optimal choice nor it has been adopted somewhere in the similar pattern as we have experienced in case of the ‘spectrum auctioning’ and ‘number trading’. On the contrary, the access ‘rights of way’ are often given to the eligible applicants on the leasing terms for a limited period of time at relatively nominal rates (when compared with the spectrum auctioning). In this case, the restrictive but an effective and optimal use of the granted rights in line with the given guidelines has been regularly monitored by the relevant authorities; in order to notify the convicted parties about the possible infringements. In addition to that, the ‘rights of way’ cannot be resold by the ‘franchisee’



(the access-rights holder) to a third party without having the due permission for it beforehand, or following the declared procedure as mentioned by the relevant authorities in this regard.

Intven (2000) argues that “sharing of such infrastructure can significantly increase the efficiency of telecommunications supply also in economic terms. The same is true in case of sharing building space in exchanges in order to permit two or more operators to ‘co-locate’ their cables, radio transmission facilities and other related equipments. Collocation permits direct (or near-direct) access to exchange switches and local access lines. Availability of infrastructure sharing and collocation can significantly decrease barriers to competitive entry.” Since the public incumbents have historically enjoyed access to such rights of way as taken for granted due to being considered a ‘natural monopoly’; hence, some regulators require the incumbents to permit infrastructure sharing & facilitate the collocation of competing operators in their exchanges, as part of their obligation.

However, comparing to the ‘infrastructure sharing’ concept, the term ‘interconnection’ is generally used in context of connecting with the incumbent’s core network, since it involves control over the ‘essential facilities’ (read the following sub-section); thus it refers to a case of ‘basic access’ and ‘entry’ from the competing operators into the incumbent’s core business. So, in the case of interconnection, the risk of anti-competitive behavior is relatively higher than in case of infrastructure sharing; since here it only involves a market based transaction and generally doesn’t put any regulatory restrictions on the infrastructure owner to compellingly share it with its competitor. In this case it is still at the owner’s discretion, whether to share or not to share its infrastructure at the given terms and conditions with its competitor; especially when the other choices (or the competing/duplicative networks) are available for the requesting operators in order to choose among from. Hence in this case, it is more like a market-led transaction process between the engaged parties without any involvement of the regulator (especially, when multiple choices are available); since there is no issue involved here about control over the unique ‘essential facilities’.

In Pakistan, the rights of way (RoW) has been considered a big issue by the competing operators, since they find it increasingly difficult to get prompt responses from the local authorities or municipalities in order to erect the telecom towers, build sites, or lay down cables, particularly in the cantonment areas. The operators mention that the RoW fee per single tower installation is up to Rs. 5 lack (Rs. 500,000) which has been considered as currently making a significant portion of their total ‘sunk costs’ incurred during the network rollout, in addition to the paid licensing fee. The operators are upset about the absence of any standard pricing mechanism for the charged fee in terms of RoW for different installations across the country, since there have been frequently found large variations between the prices charged by different municipalities, towns administrations, local/district governments and cantonment authorities. Apart from the fee issues, the operators even face severe restrictions particularly from the cantonment boards on deploying their networks.

The operators consider these bureaucratic delays a harsh impediment in their efforts for the rapid network rollout; since due to these unnecessarily elongated bureaucratic procedures, the operators are often delayed in their time-bound infrastructure deployment, which essentially cause them

significant business losses. The operators argue that in order to erect even a single tower, an operator requires bringing six to seven different types of NOCs (No Objection Certificates) in order to proceed further, which involves dealing with not only the corrupt practices in the public sector, but also with their unacceptably slow responsiveness. It has been told that in the presence of such unfriendly business environment; even a small scale government official may potentially make a large operator totally hopeless if he starts behaving obstructively. The operators assume that there is a prevailing mentality (a 'preconceived notion') among the government and the local authorities about the telecom industry that it is a 'cash cow', and thus required to be squeezed up as much as possible, even without considering the long term consequences and implications of their irrational policies. The operators demand a uniform and standard policy with respect to accessing these rights of way all across the country for all operators, in order to enhance the level of transparency and certainty in this process.

The wireless broadband operators explain that there are currently more than 28000 towers (est. 2009) installed across the country by the cellular operators. Hence, the government wants the WiMAX operators to bargain with these cellular operators for the infrastructure sharing in order to avoid any duplication of installed networks. The infrastructure and spectrum sharing idea was principally appreciated by the WiMAX operator both from the economic and environmental reasons; but the experience in bargaining with the cellular operators for infrastructure sharing has been called not quite encouraging; since the offered terms and conditions, and the charged tariffs for infrastructure sharing has been considered very impractical and unacceptable for WiMAX operators. The WiMAX operators understand this move as a rational approach on behalf of the cellular operators' perspective; by commenting that "why would the cellular operators ever like to facilitate a new entrant in the broadband wireless market if it feels threatened by the new entrant both as a potential competitor in data communication (broadband market), but possibly also in the future context within the voice market as well." Even though difficult to presume at this stage; however, the projected scenario may turn into a reality if the current regulatory restrictions on WiMAX operators in the provision of VoIP services and roaming facility to support both the data and voice mobility were removed at some stage. However, the author here further assumes that realizing the above projected scenario would additionally require the maturity and compatibility of the mobile WiMAX technology (802.16e) to efficiently support the voice mobility, in addition to a significant drop down of the network costs; in order to support a competitive and cost effective 'voice mobility' solution, especially when compared with the cellular voice services.

The cellular operators also acknowledge that the government has encouraged infrastructure sharing in its new telecom policy. However, as sharing its experience, one cellular operator discloses that following the spirit of the issued policy, the operator approached to a couple of other cellular operators to seek their inputs about this idea. But it was discovered that those relatively larger and well-established operators responded in negation; since they considered infrastructure sharing concept might be used in favor of their competitors, which they didn't like to happen. The cellular operator further argued that from the strategic perspective, such a response from those relatively larger and incumbent operators was understandable; but from the 'corporate social responsibility'

(CSR) and environmental perspectives, such an uncooperative response cannot be justifiable. Hence, here again it is apparent that the 'economic agents' are often not interested to seek for achieving the 'social objectives' at the cost of their predefined 'economic objectives'.

However, the LDI operators and ISPs argue that from their perspective, the actual bottleneck still remains in accessing to the last-mile copper wires (also known as the 'local loops'); both in case of delivering the landline and internet services. That is where, PTCL has been called fully enjoying its sole control over the local loops; at least to an extent of the copper-wired access, due to its already installed capacity of around a million lines and access to the essential rights of way, particularly in case of metropolitan cities. However, PTCL defends itself saying that there is no issue as such regarding 'rights of way', since it has nothing to do with either PTCL or PTA, but these rights are in fact issued and governed by the local bodies, highway authorities, and the local governments or municipalities. PTCL questions the arguing operators that if the copper-based local loops have so much strategic significance for those competing operators, then why not they themselves invest in laying down their own cables? However, the author considers the current debating issue as more of accessing to the 'rights of way' and 'infrastructure sharing', instead of debating about the new deployments as PTCL suggests to the arguing operators; since in the presence of highly restricted RoW, how come the incumbent may expect the new operators to lay down their own copper networks, that essentially presents a starkly different scenario when compared with the terms & conditions that the fixed incumbent enjoyed over the decades as being privileged like a 'natural monopoly' and public incumbent to deploying their networks under the government's patronage.

In response to PTCL suggestion, the competing operators reply that they are not interested to invest in copper wire installations any more due to the prohibitively higher costs of their installations and maintenance. However, they are rather more interested to invest in delivering wireless access solutions due to their relatively lower costs of installations and maintenance; and in laying down the fiber cables due to their incomparably higher bandwidths to support the future traffic requirements. The major reason for the significantly mounting costs of maintenance in case of the copper or fiber-based cables has been referred to the very high risk of facing frequent damages to the ducts and cables due to the ongoing road-works and diggings for parallel installations by different public and private utility companies (such as water, gas, sewerage, electricity, phone and cable TV). The unfortunate part of this dilemma unfolds when all these road-works and parallel installations are done without any prior coordination between these utility companies & public authorities; hence with no accepted liability to claim against for, in order to be compensated for the incurred damages.

The operators and author jointly suggest here a proposal to make responsible an unbiased company or an independent organization to take care of commonly owned and deployed, and hence fairly shared telecom network facilities and public infrastructures among the competing networks; in order to avoid duplication of networks and also to counter the privileged or unfair treatment with any particular operator. The Canadian example has been quoted in this context; where a central company gets responsibility for maintaining the coordination between the different networks and infrastructure, in cooperation with the local municipal authorities to deal with the RoW issues. In

that case, that common company makes sure the availability of multi-duct line capacity for not only the telecom operators, but also for the other utility companies such as the water, sewerage, power & gas companies. The author presumes that the realization of such a centrally coordinated capacity with fair access provision possibility (at standard rates) would essentially require the elements such as a clear vision, transparency, proper coordination and a strong political will on behalf of the government, regulator, and the local authorities to make it a successful experience; however in case of Pakistan, no such mechanism or willingness yet exists. This proposal is essentially in line with the 'Open Access Network' (OAN) or 'Open Network Provision' (ONP) model that primarily aims at the access provision on competitive basis, especially in economically unviable and far flung areas in order to effectively address the digital divide issue from the supply-side perspective. However, in case of the above proposed model, initially the primary goal would be to address the RoW and infrastructure sharing issue in the metropolitan cities and the congested population pockets; so that to overcome the challenges like accessing to the restricted RoW, agreeing on the infrastructure sharing models on fair terms and conditions, avoiding duplication of networks and wastage of resources, and addressing to the environmental and aesthetic issues accordingly.

In order to effectively implement the above proposed model; either a new company can be brought into existence with dedicatedly given tasks, or the already existing USF Company could be held responsible with given additional mandates, resources and obligations to also address the above discussed issues related to the RoW and infrastructure sharing. The Company should be then given the task to play a leading role in efficiently undertaking the presumed role after fairly engaging with all the stakeholders on equal footings, while having the institutional support of MoIT, PTA and other public authorities. The author assumes that adopting the proposed model would also help addressing the current trust-deficit element in the market; thus it would also help enhancing the scale of 'social capital' among the stakeholders. It is because all the stakeholders would then know that their spending and contributions would be effectively utilized under their own supervision for the rapid network expansion and the regular up-gradation of the deployed networks; in addition to adopting a transparent mechanism for the RoW and infrastructure sharing.

As the adoption of above discussed model is expected to produce results gradually; hence it is recommended that accordingly its share in the collected ASR should also be gradually increased, after following the performance of the Company in terms of the produced results. The author hopes here that the incumbent should also principally appreciate this idea, since adopting the proposed model would remove the sole 'burden' of serving the rural areas out of its shoulder; which has been considered so far an 'uneconomical social obligation' upon the incumbent, and due to which the incumbent consistently required the huge amount of APC as well. In the presence of LRIC-based interconnection regime in Pakistan, the incumbent should not principally oppose this idea also because of the fact that under the rationale of LRIC model, the APC is given to the incumbent 'just' for the network expansion in the uneconomical areas to only compensate their 'incremental costs' without including any of the incumbents' other fixed, joint or common costs, what so ever associated with the network expansion activities. Hence, it is here presumed that the

accomplishment of such an ‘uneconomical’ task by an independent third body like the USF Company should rationally and principally be appreciated by the fixed incumbent as well.

### **7.10 The Control over ‘Essential Facilities’**

The concept of ‘essential facilities’ (or sometimes referred as ‘bottleneck facilities’) has been debated in the regulatory literature under the competition subject. Intven (2000) defines the term ‘essential facility’ in relation of the following three characteristics.

- It is supplied on a monopoly basis or is subject to some degree of monopoly control
- It is essentially required by the competitors in order to compete on a level playing field
- It cannot be practically duplicated by the competitors for technical or economic reasons

Historically, the incumbent operators (the old time PTTs) have had their control over the ‘essential facilities’, which were basically built and paid by the government for the provision of telecom services to the general public under its social obligations. At that time these public entities were considered to be the most efficient means of delivering telecom services to the public under the popular assumption of ‘natural monopoly’; in order to avoid the unnecessary duplication of networks and basic telecom facilities. However, after the privatization of these public entities and the start of a new competitive era, the situation dramatically changed; hence it then required a renewed focus and a fair treatment of the issue on the merit. In context of the local telecom market, the most significant ‘essential facilities’ are considered as the access to the highly in demand RoW, the last mile copper wires (local loops), and the control over internet (central) exchange. Internationally, the regulators require incumbents to facilitate competition by providing access to the essential facilities to all market players on fair terms. However, over the time as new access and transport technologies evolve; the relative significance of different essential facilities may also change. Hence, in result of that a previously considered essential facility may become obsolete to be discarded from the list, and new items may also be added in the list of ‘essential facilities’ accordingly. For example, with the advent of WLL and fiber as access technologies, the need for copper wire is gradually diminishing, and then it would likely be removed from the equation of the ‘essential facilities’; whereas the advent of NGN technology has brought the ‘internet exchange’ into the center of focus, resulting in the addition of a new facility in the list of ‘essential facilities’.

The control over essential facilities can give an incumbent several advantages over its competitors, particularly in the absence of a strong pro-competitive regulatory regime. For example, an incumbent can use its control over the essential facilities to increase a competitor’s costs by increasing the charged prices for accessing to those essential facilities; hence, making the competitor’s services less attractive for the customers. In an extreme case, it can simply refuse or unnecessarily delay the supply of essential facilities to its competitors. It can also discriminate by providing inferior quality essential facilities to its competitors, as compared to itself. Anti-competitive discrimination in the provisioning of essential facilities can take many forms, some of which have been said even quite difficult to be easily detected. Hence, it becomes a regulatory concern to ensure that the essential facilities are available to all competing players on reasonable

terms. It is obvious that without ensuring such indiscriminate access to the essential facilities, the competition will suffer; hence the collective performance of the sector as well.

Dealing with the local loop challenge, there could be two possible solutions: one is to effectively enforce the ‘unbundling of local loop’ regime on the fixed incumbent in order to make separate the data and voice traffic at the local loop level; and secondly through effectively promoting the Wireless Local Loop (WLL) as an alternative access solution to the previously dominant Fixed Local Loop (FLL). Finally it remains the issue of the incumbent’s control over the central exchange, which is globally named as the ‘Internet Exchange Points’ (IXP). In the recently deployed modern IP-based NGN networks, these IP-exchanges increasingly receive the central attention in the whole range of competition related debates. The central IP exchange in Pakistan is called ‘Pakistan Internet Exchange’ (PIE) that situates in Karachi. The function of PIE has been further elaborated in the following sub-section.

### *The Pakistan Internet Exchange (PIE)*

An Internet exchange point (IX or IXP) is a physical infrastructure through which Internet service providers (ISPs) exchange Internet traffic between their autonomous networks. The primary purpose of an IXP is to allow these individual networks interconnect directly via the exchange, rather than through one or more 3rd party networks. There are numerous advantages of the direct interconnection but the primary specified reasons are related to cost, latency, and bandwidth. The IXP reduces the portion of an ISP's traffic that must be delivered via their upstream transit providers, thereby reducing the average per-bit delivery cost of their service. Furthermore, the increased number of paths learned through the IXP improves routing efficiency and fault-tolerance.

It has been informed by the operators and other internet sources that all incoming and outgoing traffic generated to and from Pakistan (both local and international) whether it is data, voice or video are routed through the central exchange called PIE (Pakistan Internet Exchange), which is administered by the fixed incumbent PTCL. PIE was created in the year 2000 to cater for connectivity needs via a single core backbone for the whole country by providing peering points to ISPs. Another purpose of PIE essentially includes the filtering of the generated and incoming contents in accordance to the government’s policy what it deems fit to be accessible to the general public. PIE has also been used to keep track of all the incoming and outgoing traffic for a specified period. However, some sources claim that despite the best efforts, a complete monitoring (policing) of all the data would be too resource consuming choice for the regulator.

The PTCL controlled PIE Infrastructure has been recently upgraded and expanded. Expansion and up-gradation of the existing network includes the provisioning of new Core Routers with Gigabit capacity installed at Karachi (KHI), Lahore (LHE) and Islamabad/Rawalpindi (RWP). These distribution routers provide connectivity to 34 Telephone exchanges across 19 major cities of Pakistan<sup>58</sup>. Domestic Connectivity to other cities within Pakistan is provided through either

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<sup>58</sup> <http://www.arwentech.com/files/ptcl-pie.asp> (Accessed on November 19th, 2010)

Synchronous Transport Module STM-1 (155Mbps) or E3 (34Mbps) links<sup>59</sup> as mentioned in the following PIE Topology, which illustrates three functional layers i.e. access layer, distribution layer and core layer respectively. The international internet connectivity is made through either submarine fiber cables or satellite links. However, the currently available satellite bandwidth capacity has been called not sufficient (est. 2011) to provide the necessary backup for Pakistan's telecom traffic connectivity with the international communication hubs, especially in case of facing severe disruptions or fault occurrence in the submarine fiber links, as have been experienced several times during the last decade. There are three submarine fiber links that connect Pakistan with rest of the world which will be discussed further in the next chapter.

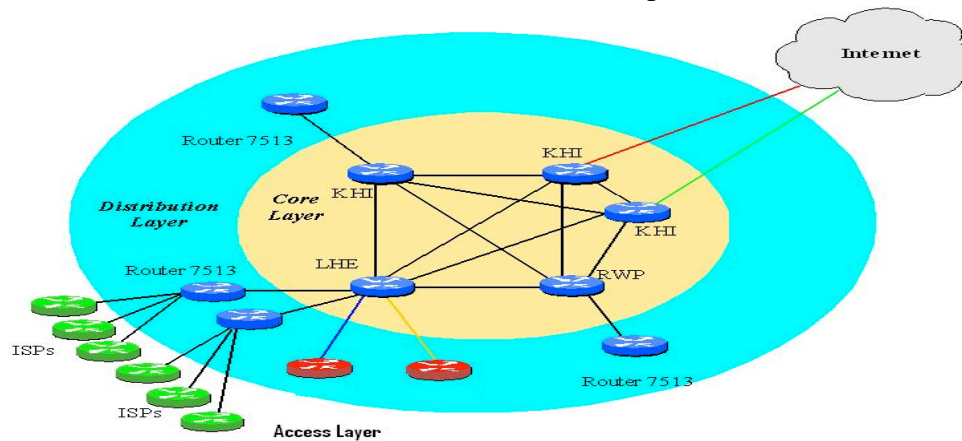


Fig. 18: Pakistan Internet Exchange (PIE) Topology

Source: Jadoon & Mehmood (2005a)

PIE is the only Internet backbone of the country; however, it has been reported highly susceptible to Denial of Service (DoS) sort of attacks from hackers in the past, whereas it has been also seen vulnerable to severe disruptions for weeks in result of the damages occurred to its submarine international fiber cables connecting Pakistan's internet traffic with rest of the world. These grand scale network failures have also severely damaged the country's image as an IT-friendly country (Tee, 2003). It is mentioned that each time the network was down – it brought down the entire country's Internet access to a grinding halt. The article further debates that most of the time these accidents have been used often as an excuse to cover up the incompetence and mismanagement of the administrative authority; given the example that the delayed troubleshooting response and a poor implementation of Internet censorship regime has nothing to do with these excuses.

Tee (2003) further argues that internet by definition is meant to be tolerant to physical disruption of individual network segments with the possibility of alternative backup provision to ensure a continuous 'seamless connectivity'. There is no reason why this shouldn't be possible in case of Internet connectivity in Pakistan. The article insists on the fact that "in order to get to this point, it has to be ensured that instead of having a single point, we must have multiple entry and exit points for the national Internet access. Theoretically, while even today technical options exist that would enable ISPs to connect to some other bandwidth source (other than PIE); but the tariffs for

<sup>59</sup> Source: Mehmood, Jadoon and Sheikh (2005b)



International Private Line Circuits (IPLCs) have been crafted in such a way as to make them economically unfeasible. The industry has been long screaming to bring some rationalization to the IPLC rates, however without any success.”

The effective use of Rooftop VSAT (Very Small Aperture Terminal) satellites for full duplex broadband connectivity and transmission of packets has also been called a viable option to introduce diversity in connections. The section 2.6.1 of ‘Deregulation Policy’ (2003) clearly states that the “companies in the Information Technology business can set up satellite based direct international connectivity for call centers/IT services under franchise agreement with PTCL.” In line with this policy statement, the above cited article argues in favor of the commercial use of VSAT satellites for the internet connectivity in Pakistan for the willing ISPs. This is expected to also diversify the sources of internet bandwidth in the country, and in addition to that the limited point of failures that the national network currently faces would be effectively replaced by the multiple entry and exit points. It is further informed that India has already allowed the multiple access opportunity for the service delivery, and it is also reaping the resulting benefits in terms of network robustness. Hence, the only proven way of remaining unaffected by such disruptions caused by the DoS attacks and accidental damages to some part of the communication links is to have plenty of bandwidth available through multiple entry and exit points on the Internet.

The fixed incumbent however, explains that in the long distance and international carrier business, PTCL doesn’t hold any control, and the ISPs and voice operators are free to choose among multiple alternative networks to route their traffic. It also acknowledges a growing competition in the LDI business, primarily among the three major carriers namely PTCL, Link Direct (subsidiary of the mobile incumbent ‘Mobilink’) and Wateen Telecom (the sister company of the cellular operator ‘Warid Telecom’); whereas a head-to-head competition also exists within the international carrier business in between PTCL and Trans World Associates (TWA). Hence the domestic companies can now lease bandwidth and get connectivity to route their traffic both inside the country and to international destinations using multiple competing networks. PTCL declares that it finds no competitive or regulatory issues regarding the long distance and international carrier business in Pakistan. It has been reported<sup>60</sup> that under the supervision of PTA, an agreement called ‘local internet peering’<sup>61</sup> was signed in July 2009 in between PTCL and TWA on the establishment of local Internet peering for routing of domestic email and Internet traffic. It was decided that initially the link between two parties will be of Fast Ethernet providing a peering capacity of around 80 to 90 Mbps. This regulatory arrangement has been considered a stepping stone towards bringing the cost-efficiency vis-à-vis international IP bandwidth by restricting local internet traffic within the country. Besides that, it will also provide routing efficiency especially in accessing the locally hosted websites. This regulatory arrangement has been considered to have an indirect impact on the proliferation of local internet content development industry as well in the coming years.

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<sup>60</sup> <http://www.itinsight.info/2009/07/local-internet-peering-pakistan-pta-twa/> (Accessed on February 18<sup>th</sup>, 2011)

<sup>61</sup> Local Peering agreement binds the two or more contracting ISPs to tie up their circuits for free of cost clear mutual traffic – for mutual benefit – hence, both parties stop paying to a third party for traffic that they originate for each other.

### 7.11 Price & QoS Regulations – Affordability & Billing Transparency

The affordability has been generally considered among the key reasons for the relative difference in the adoption of the compared telecom services. However, in case of mobile services, the consumers were found more concerned about the lack of billing transparency, than the higher prices of the consumed services. Particularly, the enforcement of CPP (Calling Party Pays) regime greatly reduced the cost of using the mobile service, especially when mostly used in the reception mode; hence that made it affordable for even a poor man to effectively use the mobile phone for receiving calls and messages, without spending anything. On the other hand, in case of having a fixed line subscription, a fixed monthly line rent has to be paid even if the calls were not made at all. The cellular operators further explained the second major reason for the increased affordability of mobile services while referring to the pricing scheme of ‘countrywide uniform calling rate’ that provides the facility to call anywhere across the country at standard local call rates. This service was offered at the time when such a scheme was not yet implemented in fixed line service, and it remained quite costly that time making NWD & LDI (ISD)<sup>62</sup> calls from landline telephone. Hence, the fixed incumbent was again delayed in assessing the future market’s pricing trend in order to have quickly and effectively responded to the changing market dynamics. In result, the fixed line incumbent lost its dominance over the voice market, and thus most of the local, NWD and international voice traffic moved to the mobile networks; primarily because of their affordable rates, keeping apart the other irreplaceable competitive advantages of mobile services over the fixed line services. However, realizing the fact and the changing competitive market dynamics, the fixed line operators also reduced the prices accordingly, but it was considered too little too late, because people had already made their mindset to switch to the mobile phone service by that time.

In case of broadband services, again the higher prices have been considered among the major bottleneck in the adoption of these services. From the affordability perspective, the telecom users insist that the prices for the broadband services and the required accessories (such as the desktop, laptops, routers, cables etc.) should be made more affordable. Hence, in many cases where the need is felt and the basic awareness and usage skills are also present; such as in case of the university students, but still the observed very low level of broadband diffusion has been attributed mainly to the affordability issue. Hence, in such cases the author sees a vital role for the government to take lead in facilitating the successful launch of ‘micro-financing’ schemes. In such schemes, initially the university students and the government sector employees may be considered as the potential candidates to start with. Such collaborative schemes may need an active involvement from the banks, computer vendors, dealers, data operators and the university administrators. Such a jointly funded or a ‘collaborative financing’ scheme would also ensure the recovery of the invested amount in easy installments. The academia considers such a Public-Private Partnership (PPP) model a viable option for addressing the affordability issue in the provision of ICT services to the targeted communities e.g. the university students, public and private sector employees etc.

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<sup>62</sup> NWD, LDI and ISD stand for: Nation-Wide Dialing; Long Distance International; and International Subscriber Dialing respectively

The data operators also consider the fact that the ‘affordability’ factor plays a central role in the diffusion of broadband services in Pakistan. However, CCP believes that as the relative competition and the broadband market size will grow over the time, the currently higher prices of broadband services would eventually drop, as experienced in case of the mobile services. In the developed countries, the 3% spending of household income on ICT services (including the landline, mobile and broadband altogether) has been generally used as a ‘thumb rule’; however, in case of Pakistan, the ICT spending has been estimated above 10% of the monthly income of an average person which is considerably high, knowing the fact that more than half of the total population is still reportedly living in severe poverty. The operators however blame the government for the increased inflation and the reduced purchasing power of an average consumer. In addition to that, there has been found a stark difference between the relative cost of consuming the broadband and mobile services. The average purchasing cost of the user terminals and service charges in case of using broadband services has been estimated around 10 times higher than of using mobile services. But despite the higher terminal cost and service charges, the relative worth of the broadband usage in terms of its relative usefulness and relevance is currently by no means anywhere closer to the perceived value of the mobile services from a common man’s perspective. This gives an additional explanation why internet couldn’t yet diffuse in the mass market, because neither it could hit the actual need of the mainstream user market, nor it has been made affordable and within the economic reach of a common man.

The prices currently charged in Pakistan for the provided data rate has been noticed too high when compared with the charged prices in the developed countries, which highlights the issue of affordability, particularly in context of the broadband diffusion in a developing economy. The fixed and internet incumbent has recently introduced broadband wireless EV-DO (branded as ‘EVO’) service with speed up to 10 mbps (the theoretical speed) at a price Rs. 10,000/month (118 USD). In average the broadband price in Pakistan is around Rs. 1200 (\$14.1) for 1 Mbps unlimited access.

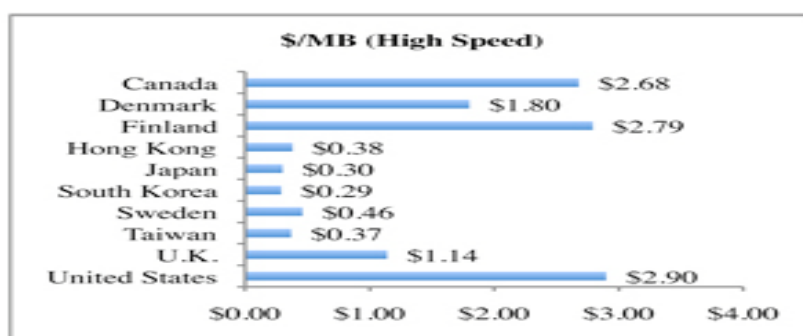


Fig.19: USD (US dollar)/MB Price for broadband

Source: Losey & Li (2010)

However if we compare it with the broadband rates of S. Korea (\$0.29/mbps), then it becomes obvious that the broadband rates in Pakistan is about 49 times higher than of S. Korea. Let’s now also consider the relative difference within the purchasing power of an average consumer of the two

compared nations' in terms of GDP/capita (PPP)<sup>63</sup>. The data reflects that an average Pakistani consumer's purchasing power (\$2600/annum) is about 11 times (round-off figure) lesser than of an average S. Korean consumer (\$28000/annum). Hence the above two figures make it obvious that a Pakistani consumer is actually paying around '539 times' more than the relative value (in terms of data rate) it extracts in return of its spending on the broadband services. Hence, it is important to remember the fact that the relative 'affordability' however still remains at the crux of any comparative diffusion analysis of telecom services in any country.

On the issue of affordability and price regulations, the operators are generally in favor of an effective 'price-cap regulatory regime' in Pakistan, while arguing for setting up both the 'floor pricing' (i.e. the bottom line price) as well as the 'ceiling price' (the maximum allowed price) for each telecom service within the provided services' specifications; in order to curtail the anticompetitive practices of 'predatory pricing' and 'vertical price squeezing', if attempted either by the incumbent or any other large operator. The regulator has been also requested to counter the anticompetitive practices of 'cross-subsidizing' and the 'tied-sales or product bundling', which potentially may also distort the market competition (the explanations about the used terms here are available in Intven, 2000 and Melody, 1997). The operators further argue that the regulator should not totally rely on the market forces in letting them to self-regulate the prices; hence at occasions the need for regulatory intervention is felt significant in order to effectively enforce the price regulations in a desired way. It is assumed that adopting 'price-capping' effectively would help the telecom market, particularly the cellular industry to come out of the current vicious cycle of cut-throat price competition; which has essentially distorted the industrial profits due to an unavoidable 'price-war' between the market players for their individual survival. In result, the current cellular market seems to be primarily led by an unhealthy price competition; instead of being driven by innovative and value-added services to have maintained a reasonable profit. MoIT principally agrees with the operators' stand on that issue, as considering the need for an effective price regulatory regime to curtail any anti-competitive move from a dominant player. Thus MoIT criticizes the way market has been left without any effective 'price-capped' regulation. In this context, PTA however seeks for an increased regulatory mandate across both the IT and telecom sectors in order to effectively implement the 'price cap' regulations on different telecom services.

On the issue of hidden charges, the cellular operators refute the impression that they are involved in charging excessively to their customers, arguing that "these days there are no such hidden charges exist as were known in the past; since PTA strictly monitors the packages offered by the operators, their billing system and the consumers' complaints in order to find out any of such misconduct." However, the competition regulator (CCP) wants all the hidden charges be withdrawn by the operators. CCP refers to a past case where the customers were additionally being charged (10 paisa/SMS for the billing query) without having them informed beforehand about the new billing system since previously it has been considered a free service. CCP suspects similar kind of practices might also be happening in the case of 'missed calls'; hence it intends to probe this case as well for

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<sup>63</sup> [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_GDP\\_\(PPP\)\\_per\\_capita](http://en.wikipedia.org/wiki/List_of_countries_by_GDP_(PPP)_per_capita) (Accessed on January 14<sup>th</sup>, 2011)

the consumers' welfare if complaints were filed against the cellular operators. The competition regulator wants the things to be done transparently by all operators in the billing process through making the users well-informed. PTA also wants the operators to withdraw all sort of hidden charges from the charged bills or they should make them clearly visible in line with the agreed terms and conditions.

Finally, it seems relevant to also briefly discuss here the critical relation between the price and quality of service (QoS) regulations. The regulatory literature acknowledges the accepted wisdom that 'a fall in quality of service is a hidden price increase' (Milne, 1997 b); hence it has been recommended here that PTA should check on the both aspects simultaneously in order to observe and correctly anticipate how the change in one variable (price) may affect the second variable (QoS) or vice versa. However, it has been mentioned by the regulator that currently its commercial affair department is taking care of the price relevant issues, whereas the QoS issues are supervised by the consumer affairs department; and the two departments carry out their respective operations independently without any significant scale of mutual coordination or following any formal procedures for information sharing. Hence, the author recommends here that instead of managing these mutually interlinked variables separately by two independently working functional groups; there should be one single body to take care of the both mutually dependent variables. Otherwise there should be at least an enhanced scale of interactions between the two departments, while they carry out their operations and the respective analysis; in order to correctly interpret the relative impacts of any change in one variable on the other variable accordingly.

## **7.12 Technology-Neutral Licensing Regime**

The basic concept and the need for 'technology-neutral' regulations have been increasingly discussed in the regulatory literature (e.g. Collins & Murrone, 1997; Koops, B. J., 2006). In result of an ongoing technological and digital convergence between the previously considered as separate technologies such as computing, broadcasting and telecommunications; the similar services can now be supplied on different technological platforms using different access and transport technologies. Hence, in response to this convergence phenomenon, the regulatory practices across the technologically advanced countries suggest that regulators should not back any particular technology at the cost of other, but should rather seek ways to promote competition between different technological solutions. Regulators are here encouraged to make decisions that are driven by the socioeconomic impact, while focusing at the public's interest foremost; instead of being biased in technological preferences. It has been commonly acknowledged that the use of multiple technologies may create opportunities, which help bridging the 'digital divide' and to attaining the broader socio-economic objectives. Furthermore, the competition that emerges between technologies as a result of adopting a technology neutral regime opens up new dimensions that significantly might help in prudently addressing the broader socio-economic issues.

Koops (2006) prefers technology-independent legislation for the reason that such 'neutrality' can better withstand the technological turbulence. However, sometimes in order to deal with the legal uncertainty; instead, the technology-dependent legislation has been given preference. Nevertheless,

it has been argued that the concept of ‘technology-neutrality’ within the policy documents and regulatory instruments has been often used either to stress something (or to protect a hidden agenda); hence, what is actually stressed may not always be the same point. Koops (2006) further explains that “the starting point that ICT regulation should be technology-neutral turns out to be a sweeping statement that can be put in many uses. From the perspective of the goal of regulation, the statement stresses that, in principle, the effects of ICT should be regulated, but not technology itself. From the perspective of technology development, the statement stresses that, in principle, regulation should not have a negative effect on the development of technology and should not unduly discriminate between technologies. From the perspective of legislative technique, the starting point stresses that legislation should abstract away from concrete technologies to the extent that it is sufficiently sustainable and at the same time also provides the sufficient legal certainty.”

In context of Pakistan, the deregulation policy (2003) apparently claims to be in favor of ‘technological neutrality’; however the licensing regime doesn’t seem to be following that principle of neutrality. It is because of the fact that it clearly restricts certain types of licenses to be only used for delivering certain specified services; such as CVAS licensees (data operators) are not allowed to carry or support voice services using their data networks through adopting VoIP technology. Similarly, the WLL and WiMAX operators (with LL licenses) are not allowed to support either data or voice mobility, or in other words to deliver the roaming facility to their users, since roaming service has been only legitimized for the cellular licensees. The author considers such demarcations, restrictions and segregations between different technologies based on licensing, an irrational approach, which is also against the very basic spirit of ‘technology neutral’ regulations.

The wireless broadband (WiMAX) and WLL operators have been generally found vocally advocating in favor of adopting the ‘technology-neutrality’ approach in the telecom regulations, particularly in the licensing policy; however, the incumbent and the cellular operators were fiercely opposing any such idea, in order to protect their business interests and based on the argument that “the cellular operators currently even cannot meet their breakeven point due to having committed huge investments in just buying these expensive licenses in around \$290M each, which has been called having no match with the license fee paid by the WLL or WiMAX operators.” Hence, they consider it very unjustified to open up the voice mobility market in an irrational way, which they presume would create further chaos, fragmentation and destructive competition in this already fiercely competitive market.

On the other hand, even though the WiMAX operators were not found yet ready to come into voice market; but principally, they condemn the policy of restricting the voice mobility features for the WLL and WiMAX operations. The current regulation constrains the WLL operators to not support call handover or roaming facility, since their operations are legally restricted just within the radius of a single BTS range that varies between 5-25 km (whereas, in case of WiMAX could be as low as 500 meters) depending on the traffic volume and geographic landscape. These operators view that a technology cannot be restricted forever; since the rational of optimal utilization of technological resources under the underlying principle of ‘technology-neutrality’ demands for an equal treatment



of all technologies; irrespective of the financial concerns associated with these restrictions, such as the licensing fee issue. Following this line of argument, the broadband operators favor the licenses to be issued based on the ‘beauty contest’ mechanism; instead of being sold out through ‘auctioning’ at a huge fee. They consider adopting the ‘technology neutrality’ policy in its real spirit would help the market get fully liberalized, and it would also encourage all the competing technologies to compete based on their performance and innovativeness.

One cellular operator was however in favor of implementing a fully functional ‘technology-neutral’ regulatory regime as acknowledging the fact that “one cannot block the mind of an innovator; and neither one can block the use of a particular technology by using delaying tactics. Sooner or later we would have to adopt the new technological developments in order to keep abreast of the times. The technologist and innovators always outcompete the regulatory barriers, as technology evolves over time; hence the regulator must need to understand and adapt with the future directions using its observation and technological foresight of the concurrent technological developments across the world.” The author agrees with the above line of argument, as witnessing the fact that no government or the regulatory regime can ever stop an emerging technology with the help of creating policy and regulatory barriers, and that is considered to be essentially a naive approach, which would merely delay the adoption of innovative technologies; resulting in further deprivation of the general population from the benefits of the emerging technological opportunities. The legality and illegality of different access and transport technologies is a never-ending debate; and the author presumes that these debates are often used as a shelter to temporarily protect the interests and stakes of a particular group of stakeholders (generally the dominant ones, due to their relatively stronger influential and lobbying power) as compared to the general benefit of society or market as a whole.

MoIT also acknowledges the fact that apparently in the end; it’s all about the ‘conflict of interests’ game to protect the vested financial interests of different engaged stakeholders; instead of thinking in the wider perspective about the societal benefits in terms of serving the social objectives. MoIT however explains that the primary purpose of a government should be to always first think about the public interest (i.e. the benefit of an end-user and the society as a whole), due to essentially being a public representative. MoIT principally agrees with the above presented arguments in favor of the ‘technology neutrality’ principle. It presumes that the above stance fundamentally provides a logical foundation; hence it would be given a thoughtful consideration during the forthcoming revision of ‘licensing policy’.

### **7.13 Excessive Licensing vs. ‘Inefficient Entries’**

The respondents also discussed the impacts of excessive licensing on the market competition, and particularly in context of the potential risk of ‘inefficient entries’. It has been argued that ever since the market was opened up under the telecom reform movement in Pakistan, the regulatory authority seems to be over exercising the licensing tool in its attempt to introduce competition in different telecom markets. Although the limited licensing approach has appeared to be a successful experiment in case of the cellular market; however, no such comparable results were observed



either in terms of the established competition or with respect to the observed market growth in case of other telecom services.

During the past few years, there were 14 LDI licenses issued out of which 12 are now called operational, which reflects relatively a better result. However, in case of the Fixed Local Loop (FLL) there were 37 licenses issued, mostly during the years 2004-05 on the regional basis. However, only 18 out of 37 FLL licensees could have survived, and other licenses were eventually revoked; whereas out of the remaining 18 licensees, there are further five licensees, which are reportedly still having nonoperational status; hence their licenses are also expected to be revoked soon. It is relevant to mention that the result of issuing these 37 licenses only could have brought competition to that extent in the fixed local loop market that currently apart from the fixed incumbent PTCL, and NTC (National Telecom Corporation) which is also a government owned operator dedicated for serving the official departments only; the share of rest of the licensees are even less than 1.5% altogether, which clearly reflects the failure of licensing experience in case of FLL market. On the other hand, in the Wireless Local Loop (WLL) market, there were 14 licenses issued out of which 6 licenses were countrywide (since those operators bought licenses for all the regions); whereas the remaining 8 licenses were only assigned for specific regions. In this case as well, apart from the incumbent PTCL, only three other operators are observable in terms of their market shares; and the collective share of the three competing operators are 50% of total market share, whereas the rest half of the market share is still held by PTCL. Even though there is concentration in the WLL market, but still a moderate competition does exist. Finally, the most interesting case is the experience of CVAS license distribution among 800 data operators (ISPs), out of which only 200 are shown as still operational on the regulator's website; whereas the rest of 600 licensees were mostly terminated or their operational status was mentioned as 'not available', and even 'not traceable' in many cases.

The question is raised here whether this is the right approach to distribute the licenses excessively in the currently adopted fashion in hope that the 'market test' will filter out on itself the competitive players out of the created mess? The established operators strongly disagree with the dominant regulatory logic that essentially follows 'survival of the fittest' theory. They operators argue that the theory only applies in that context when a certain level of maturity and stability already exists in the market. They view that the teledensity in the fixed line and broadband markets would not grow merely by distributing the licenses; even if the current number of licensees were doubled, since it will only end up in creating further mess and chaos in the existing market resulting in a 'fragmented market'. They further argue that assigning licenses in that fashion would risk overcrowding and allowing 'inefficient entries' into market, since they would then perceive the licenses 'as taken for granted', which may likely result in the 'tragedy of the commons' (Hardin, 1968); in terms of the over-exploitation of easily available abundant resources. It should also be noticed here that an incompetent entry may also distort the consumer's trust and confidence upon the new technology itself; hence creating further technological uncertainty in the market. The broadband operators consider that PTA needs to limit the number of licensees (ISPs) to let the existing internet service providers make reasonable profit to stay in business, develop the market, and grow their access

networks and services further. They consider that today there is no guarantee for any reasonable return on their investments in this business. The broadband operators have a clear stance in this regard that a limited but stable competition with gradual opening up of the telecom sector is assumed to be a better approach from the Pakistan's particular socio-economic context; instead of opening the market in an immature way, and in result creating a lot of chaos and uncertainty in the market.

The competition authority (CCP) adopts a balanced view on the issue, as saying that “an increased competition helps in overcoming monopolistic and anticompetitive barriers that also helps bringing the prices down; and thus making the delivered services more affordable for ordinary consumers. However, on the other hand, the misuse of licensing regime may also risk inefficient and less credible entries, so the sector regulator needs to create a proper balance between achieving the two objectives.” Hence, it has been suggested here to devise rather a mixed version of different existing licensing procedures that suits well the specific requirements of the local market conditions. It has been further argued that the excessive licensing may also cause wastage of resources in terms of the duplication of networks, which may also result in creating environmental and health related issues.

#### ***The Potential Entry of Mobile Virtual Network Operators (MVNOs) into Cellular Business***

A mobile virtual network operator (MVNO) is a company that virtually operates without having its own spectrum or network infrastructure; by leasing part of the spectrum and network facilities from another mobile network operator (MNO), in order to deliver its own branded voice and value-added services (VAS) to the market. However, if a company only purchase voice minutes in bulk at cheaper price from a network operator and resell it to mobile consumers with its own brand, then the company is known as a ‘voice reseller’. MVNO’s business has been called relatively a recent phenomenon. The first commercially successful MVNOs were ‘Virgin Mobile’ and ‘Tele2’ with their operations in UK/US and Sweden/Denmark respectively. Weiss, T. (2006) defines an MVNO as “a setup that has the scale to market and distribute mobile devices and services but, for financial or operational reasons, doesn’t want to invest in setting up its own radio network” (Weiss, 2006). He further explains the three basic strategies which are usually employed by MVNOs in order to differentiate their offered services in the cellular markets, which are: pricing (‘cost leadership’); branding (‘image building’); and ‘personalization’ (customization) through product bundling and developing relevant contents and applications. In Pakistan, recently the regulator has announced that it intends to sell licenses to MVNOs. PTA allows MVNO services in Pakistan under the clause 6.12 of Cellular Mobile Policy (2004). The revised framework<sup>64</sup> for MVNO services (2009) announces at Clause 2.11 that the interested companies would be provided MVNO licenses at \$5 million each for an operational period of 10 years. In order to get the market response on these additionally announced licenses; the established operators were asked to respond, how they look at this new development in terms of the market growth and possible split of revenues.

It was remarkably noticed that all the major cellular and broadband operators including the fixed incumbent itself were unanimously opposing the idea of injecting MVNOs in to the existing cellular

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<sup>64</sup> Available at [http://www.pta.gov.pk/media/mvno\\_framework\\_231009.pdf](http://www.pta.gov.pk/media/mvno_framework_231009.pdf)

market. They considered this move as an irrational and destructive for the market, since in their opinion it would neither support market competition any further, nor would even benefit the consumers in any meaningful way. They assume that this would rather lead towards further market fragmentation resulting in an intense rivalry based on the 'price-based' competition; hence leaving the cellular market totally chaotic and unattractive for the telecom investors. They warn that the possible loss of future or even the already committed investments from the established network operators would have negative consequences for the growth of mobile sector; also in terms of the lost employment opportunities. However, they acknowledge the potential or a possible role for MVNOs in developing the VAS market, such as mobile broadband services and the development of useful contents and relevant applications; instead of further distorting the voice market (as 'voice resellers'), which has already been squeezed up due to the intense ongoing 'price war' among the existing mobile network operators.

Apart from the price competition issue, the mobile network operators also show their concerns regarding the potentially faced technical and operational issues in future, in result of injecting these newcomers into cellular market. Such issues may include the billing issues and the maintenance of QoS in case of accommodating these new operators in the already congested cellular networks, which would demand further network expansion on behalf of network operators, since MVNOs are not obliged in this regard. They further argue that allowing these MVNOs to work as 'network associates' may also jeopardize the mobile network operator's market reputation, since any mismanagement or lack of efficiency in the service delivery on behalf of MVNOs would also affect the image of the supporting mobile network operators (MNOs), whose networks are being used for the service delivery. Hence, it has been seen an additional burden on the MNO's shoulder to continuously engage with these new entrants at its network facilities for the purpose of managing the points of interconnection (PoI), infrastructure sharing, collocations and dealing with the interference related issues. They further argue that these relatively inexperienced and immature newcomers are expected to be quite volatile and unpredictable in managing their business operations and the following transactions. They operators refer to the fact that they are already under the pressure due to having received multiple 'show cause' notices from PTA on quality related issues.

#### **7.14      Numbering, Number Portability, Number Trading**

The numbering plan, number portability and its trading all become crucial to market competition in the telecom business, particularly in a large country both in terms of size and population; such as in case of Pakistan. The 'numbering plan' is the scheme through which the regulator organizes and ensures an efficient utilization of this scarce resource. The available huge stock of numbers initially seem to be sufficient for the future requirements, and thus often considered as an abundant resource but as the size of telecom markets grow over time (such as in case of the cellular market which grew from 5M to 109M subscriptions in just 7 years of time), with an increased competition among a list of operators; the efficient allocation and an effective utilization of the numbering plans becomes a challenging task both for the regulator and market suppliers. Milne (1997 a) discusses the issue quite comprehensively, while shedding light on different currently in-use numbering plans

across the world. She argues for a prudent and husbandry role on behalf of the regulator to carefully assign the numbering blocks to different operators; and accordingly revoke and reallocate the under-utilized and misused numbers to other deserving operators and emerging applications.

Since the numbers of new licensees and telecom operators have grown up here like mushroom over the past few years; hence, the need for an efficient ‘numbering plan’ is accompanied with two other critical issues namely: the ‘number portability’ and ‘number trading’. The term ‘number portability’ can be used in three different contexts namely: the ‘geographical number portability’ (an issue related to fixed line numbers at the time of physical relocation e.g. home/office shifting to a different region or to a new telephone exchange); the ‘service number portability’ (e.g. simultaneously using or transferring the same fixed line number for the use of mobile services, or vice versa); and finally the ‘inter-operator number portability’ (which is the most commonly known form of number portability i.e. transferring the number from one operator to another within the same telecom service). Hence, the ‘number portability’ service ensures that regardless of what network operator, geographical location, or telecom service a user is currently attached with; the user should be capable of keeping its number even if the user had to switch around multiple operators, moving around different geographical locations and switching to different telecom services. Currently, only the Mobile Number Portability (MNP) regime is emplaced and fully functional in Pakistan, but the Fixed Number Portability (FNP) facility is not yet available (both the inter-operator and inter-regional number portability). The inter-service number portability is also quite limitedly available only in between the fixed incumbent and its mobile subsidiary ‘Ufone’ (est. 2010). However there is a need to introduce the FNP regime at the earliest in order to let this facility help establishing a competitive environment in the fixed line sector as well. However, the LDI operators suspect that the regulator is deliberately delaying this process to benefit the fixed incumbent, until the new telecom policy clearly demands for an immediate implementation of FNP.

The mobile number portability (MNP) was successfully completed in fairly smooth way. The mobile operators find no issues with respect to ‘port-in’ requests, since all companies generally welcome the new customers; however while dealing with the ‘port-out’ requests, the operators highlight some formalities which are required to be fulfilled, such as verifying the residual payments and clearing the dues (in case of the post-paid connection), and calculating the paid amount of taxes. The cellular operators mention that if all those things were found clear, then the whole procedure shouldn’t take more than a couple of days. However, the operators also admit the fact that once the customer has set its mind to quit a service or a network, then the use of any delaying tactic during the number portability process won’t help the operator to retain the customer any longer. The operators further mention that these sorts of anti-competitive practices of the old times are no longer applicable in today’s highly competitive cellular mobile market. However, the operators also highlight a negative impact of this effective enforcement of MNP regime on their business revenues in terms of customer’s decreasing ‘loyalty’ with any operator; and hence an increasing ‘churn rate’, since the customers can now easily move to any new operator without any need to switch their numbers.

The 'Number trading', on the other hand is named to a phenomenon where the numbers are being traded in an open market (e.g. on some dedicated websites or at shops), just like the other commercial commodities. The number trading has become a whole new business area in Pakistan, where the different types of numbers are given specific names such as the 'silver, gold and platinum' numbers; and thus, they are also priced accordingly. The rates vary from Rs. 10,000 to even up to Rs. 100,000 (about \$1200) for acquiring a desired number. While living there, one may expect receiving calls even at quite odd times from unknown persons, as they try to bargain for an in-use number. It is now practically impossible to get one of these highly in-demand and appealing numbers from an operator through properly following a standard procedure, both in case of the cellular and fixed numbers. It has become literally quite time consuming and cumbersome process asking for a golden or platinum number particularly for the business use in a financial district of a large city, due to the unavailability or 'occupation' (pre-reservation) of those numbers, as often informed by the operators in response to the submitted queries. Some corners even suspect that there may be an obvious possibility of the engagement of relevant employees in this 'lucrative' business, hence that issue requires regulatory attention in order to facilitate the common users.

## Chapter 8

### Debating Major Issues Relevant to the ‘Supplier Domain’

The number of market players and the competitive status of different telecom markets have been already discussed in the previous chapters. This chapter however focuses on those critical issues which have been considered relevant to the supplier domain and which are observed playing a significant role in the diffusion of telecom services in the local context. Given the fact that Pakistan is essentially a services’ market, with no significant footprints or indicating any meaningful presence of the manufacturing industry in the country; hence the diffusion analysis of this case study has been kept primarily focused on the relative diffusion of different telecom services. In result of that realization, the major share of the respective contributions in the current debate essentially come from the telecom operators and service providers, delivering countrywide fixed line, cellular and broadband services.

#### 8.1 ‘Coverage’, ‘Access’ and ‘End-to-End Connectivity’ Related Issues

In context of the delivery of telecom services to end-users; the coverage, access and end-to-end connectivity issues were frequently discussed while having the primary focus at the ‘users-end’, where the provision of the ‘last mile’ connection using different suitable ‘access technologies’ traditionally remains the primary concern. However, there is a second dimension of this debate as well, which often remains concealed from the user’s eye; and that is when looking at the issue from the ‘suppliers-end’, which essentially includes the discussions such as the suitability of different ‘transport or backhaul’ networks that is required for the long distance communication and data transmission for a seamless end-to-end connectivity across the world. The users are often unaware of the fact or actually unconcerned about the intermediate means (the transport networks) deployed by the suppliers to make possible this seamless end-to-end connectivity. For that particular reason, the access and coverage related issues are often debated mainly with reference to the deployed access technologies, which are more visible and directly interactive with the end-users.

The poor access and limited countrywide coverage has been found one of the most burning issues with respect to the diffusion analysis. While looking at the current status of the relative access to fixed line, cellular and broadband services (i.e. the status of access provision and connectivity either at an individual/household level, or at a community-based/shared-mode level); the comparative analysis makes it vivid to observe the differential access possibilities of the compared telecom services in the country. The available figures on the status of coverage and access provision clearly reflect that the telecom operators have been primarily remained focused on the financial districts and urban residential areas so far. It is because the installation and operational costs in the above cases are estimated relatively much lower, whereas the returns on investments have been assessed much higher; when compared with the case of service delivery and network deployments in the rural areas. This common economic logic essentially underpins the fundamental business model of telecom operators in Pakistan; so that they could make their survival possible in this highly capital-intensive and price-conscious market. However, the policy maker principally criticizes the operators for having adopted this sort of ‘cherry-picking’ business model, not just occasionally but as part of

their corporate strategy. The following subsections would further shed light on these issues in reference to each telecom market individually.

### *Cellular Networks*

The section 6.2 of the ‘Mobile Cellular Policy’ (2004) explains that the major objective of government is to ensure that over a reasonable period of time, the basic access and telecom services would be made available for the population living in underserved and rural areas. The policy also underlines the provision of coverage and network roll-out requirement for the cellular operators. As per the ‘Cellular Policy’, the cellular operators were obliged within their licensing terms to meet the countrywide coverage obligations over the next 4 years by rapidly rolling out their networks in order to provide access to at least 70% of the total population.

In Pakistan, GSM and its evolutionary forms i.e. GPRS and EDGE networks are used as standards for delivering the 2G and 2.5G cellular services. With respect to the coverage issue, the mobile incumbent explains that currently different operators are passing through different life cycles of their operational maturity. Hence if some of them are still entangled to deal with extending their coverage and tackling the issues like access provision and RoW, for the reason as they are still in the ‘network expansion’ phase; the other operators are in the ‘consolidation’ phase, and they are struggling to improve their quality of service through ‘network optimization’. Hence all of them have different issues and varying range of interest and preferences at different stages of their development accordingly. It has been informed by the cellular operators that the mobile service has now established its nationwide footprints with an extensive geographical coverage; covering around 80% of the land and above 90% of total population. The yet uncovered geographical areas include the tribal areas (where the access is not possible to be provided due to the security reasons) and in the far flung areas of the largest but least populated province Baluchistan (due to both security concerns and the absence of a reasonable business case). The cellular operators acknowledge the fact that in the rural areas, the largest concern of the operators (and also the consumers) is to ensure full coverage through an extended access provision with further network expansion; whereas in the urban areas, the mobile operators are more concerned about maintaining the QoS due to the traffic congestion and interference related issues by using ‘tele-traffic engineering’ and ‘network optimization’ techniques.

### *Fixed Line Networks*

Currently in Pakistan, the incumbent PTCL holds control of the fixed line access network. The fixed incumbent informs that the total fixed line access capacity (including both landline and WLL access lines) remains around 12M (est. 2010) in a country with an estimated number of households around 30M (assuming 6 persons living in an average-sized household). Out of the 12 million installed fixed line capacity, currently only 6.2 million lines (incl. both landlines and WLL connections) are in use; whereas the rest half of the installed capacity is still redundant. In this context, PTCL has been criticized by many corners for not making an efficient and optimal use of its fixed line installed capacity. As a matter of fact, most of these access lines have been laid down in urban areas; whereas statistically around 65% of the population has been reportedly living in rural areas. These facts reveal that a very large part of the country both in terms of area and



population is still deprived of fixed line access possibility at their households. On the question, whether the ‘coverage obligations’ should have been included as part of the licensing terms, similar to the case of mobile licenses; the fixed incumbent declined any such obligations on the fixed line operators saying that “if there were any such binding obligations, nobody would have ever gone for acquiring the fixed line licenses due to the presumed market inertia, lower demand, a huge upfront capital cost, and the excessive time required for building infrastructure and rolling out the fixed line networks, particularly in case of deploying the landline network and access provisioning in far flung rural areas”. The incumbent informs that there are plans to serve the newly developed areas and towns through fiber connectivity, but this cannot be a widespread solution due to the underlying cost factor involved in the fiber deployment. PTCL plans to replace the existing copper lines with fiber with the passage of time, as the cost of fiber is expected to drop down significantly in future. Even today the cost of providing Fiber to the Curb (FTTC) solution has been called more economical than deploying copper, in terms of data carrying capacity; however providing fiber to the last mile (i.e. providing either FTTB or FTTH)<sup>65</sup> has been considered still quite costly solution. The fixed incumbent further informs that it has deployed fiber rings in the large financial districts of the metropolitan cities to support FTTC; but in order to realize FTTH/FTTB to become an alternate access solution, there is still some time to wait.

PTCL has over the years heavily invested in deploying WLL networks across the country, and WLL increasingly replaces the copper-based landlines as an alternative access solution. WLL has been particularly considered a suitable solution for providing access to the dispersed populations living in the far flung areas. Currently 2.8M subscribers are provided access through WLL networks; whereas the number of landline subscribers has been gradually reduced to 3.4M over the past few years (est. June 2011). The fixed incumbent however doesn’t acknowledge the ‘cannibalizing effect’ of WLL on the landline connections; even though it is vividly apparent when looking at the patterns of the respective growth and decline of the two comparative access technologies. The incumbent perceives that the two access technologies essentially target at two quite different markets. Given the example that there are newly built residential towns and business centers where the desired demand and affordability factors both exist for the landline connections, but despite the fact no operator can financially afford to put cables over there; hence WLL seems to be a preferred choice for the operators in those cases.

On the proposal of a ‘joint collaborative initiative’ under the auspices of MoIT and PTA in order to effectively address the currently faced fixed line access issue, particularly in uneconomical areas; the incumbent however seems to be highly skeptical about the viability and applicability of such plans. PTCL seriously doubts that under the intense rivalry and competitive pressure, the different stakeholders with varying interests would ever agree on the formation of such a common platform or would be ever willing to take part in a joint initiative primarily aiming at bridging the existing digital divide through an increased access provision with a communal spirit. The fixed incumbent considers the proposal intrinsically quite ‘socialistic’ in its character; and thus doubts about its

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<sup>65</sup> FTTH and FTTB stand for ‘fiber to the home and ‘fiber to the building’ respectively

acceptance in its true spirit by different market players of the capitalist economy. The author considers that such a program would demand the available public resources to be commonly shared among all the participants (telecom suppliers) under the conditions of optimal resource utilization, and fairly distribution as per the respective market shares of the individual firms participating in the program, in addition to their performance in terms of the achieved results. Nevertheless the incumbent considers such a proposal principally an appealing idea due to the fact that no single operator can afford or even would be willing to go alone for such a mass scale deployments and for the countrywide access provisioning including those uneconomical areas. Hence, the critical issue still remains how to make them agree on a visionary but also a viable plan; in order to bring the diversified stakeholders with varying interests on board for the accomplishment of a common goal. However, the author feels that the operators often ignore or probably underestimate (in their commercial assessments) the real potential of such a huge market of ‘micro-consumers’ (that presumably compose of above 100M people just in Pakistan), who currently live under the poverty line without having any access possibility to become part of the information and communication world. There is actually a lot to learn and get inspiration from the recently observed successful case of the Grameen Bank’s experience in Bangladesh, where the rural communities were connected with the communication world through developing viable and sustainable business models for the individual rural entrepreneurs by creating a favorable and win-win situation for each other.

### ***Dialup & Broadband Networks***

In case of the broadband internet services, even the urban areas have also been declared as ‘underserved’ areas by government and independent research surveys. However, the large metropolitan cities can have restricted access to fiber connectivity in some selected areas, in addition to the currently available DSL and wireless based broadband solutions. As per the annual report (2010) released by PTA, the changing patterns of the broadband access technologies can be vividly observed there: as the collective share of the broadband wireless technologies (WiMAX and EvDO) has now increased to 41% (previously 27% in 2009); whereas the share of DSL has shrunk to 53% (while last year it was reported 63%); and the collective share of fiber based solutions such as HFC and FTTH has been also shown reduced to 6% (as compared to 10% last year). This trend clearly indicates the growing popularity of the broadband wireless access technologies. However these statistics also reflect the reduced popularity of DSL and fiber based solutions, primarily due to the fixed nature and slow data rate of DSL, and relatively higher cost and limited access (coverage) of Fiber based solutions. It is important to remember that in these statistics the mobile broadband figures have not been included among the broadband wireless access technologies; since mobile broadband service has been traditionally considered by regulator separately as a mobile ‘value-added service’ (VAS). Hence, the increased broadband usage and penetration of mobile internet has not been declared within the broadband teledensity; as per the statistics released by the regulatory authority on its website, mentioning the broadband diffusion under different access technologies.

The accessibility of dialup and DSL based internet services is limited to the availability of the deployed copper lines which currently stays around 10 million landline connections; and with this limitedly installed landline capacity, any major growth of DSL connections remains a question

mark, also due to the deteriorating conditions of the copper lines. PTCL currently claims delivering DSL access to around 414 cities and towns across the country. The incumbent also claims delivering WLL/Vfone network based internet connectivity (narrowband with 153 kbps) to about 100 cities. Let's now discuss the status of the wireless broadband and fiber access based broadband coverage in the country. In wireless broadband two access technologies have been used so far in Pakistan namely WiMAX and EvDO (with the brand name 'EVO'), and both are operating under WLL licenses. WiMAX is currently provided by four different operators out of which only one operator has countrywide presence in 22 different cities; whereas the operations of other three operators are still restricted to merely a couple of major cities. On the other hand, EVO which is provided by PTCL has relatively much higher coverage in around more than 100 cities across the country. Finally, the coverage status of hybrid fiber coaxial (HFC) cables and optical fiber (FTTH) cables as broadband access technologies is also restricted only to a couple of metropolitan cities such as Karachi and Lahore in addition to the capital Islamabad, but only within selected areas.

## **8.2 Quality of Service (QoS) Related Issues**

QoS has been among the most repeatedly discussed issue by the respondents. The operators also acknowledge the critical importance of maintaining QoS both with respect to enhancing their face value in the media reviews, but also to improve their public image among the telecom users as a reliable network or service provider. In the following sub-sections the QoS related issues as highlighted by the respondents have been discussed for the compared services.

### ***The Cellular and Wireless Broadband Services***

The cellular and broadband operators explain that the 'access provision' and 'service provision' should be considered as two different stages of development. In the first stage; the network deployment and its expansion remains the main concern of the operators in order to address the coverage and access provision related issues. Whereas in the second stage, the operators become more concerned about the network optimization and its consolidation in order to maintain and further improve the QoS related issues (such as the traffic congestion, frequent call disconnections, signal dropping, deteriorating voice quality due to channel noise and interference); and to address the issues of slower data rate, and delayed response time on the submitted queries and complaints due to the inefficiency of customer services department and technical support team. The cellular operators consider that maintaining QoS issues in such a rapidly growing market has been remained a serious concern for the operators, since most of them were still in the learning phase of effectively accommodating the fast expanding customer base.

The author presumes that the increasing churn rate and the trend of keeping multiple SIM cards may also have implications on the delivered QoS. As a matter of fact, the networks are specifically designed to support a specified traffic load; thus the resources are deployed accordingly. In case of having too many idle connections and a high churn rate, the expected traffic volume is then only a qualified estimation; however, the operators may be not assured about the activation status of registered SIMs' in different cells, particularly if the users would frequently switch over different operators' networks on the same handset while roaming around. This scenario may cause unexpected variances in the traffic volume, since if the present traffic appears to be much lower

than the estimated traffic then ‘network redundancy’ becomes an issue as network is not being used optimally; however, if the traffic volume unexpectedly go higher then it may create ‘traffic congestion’ problem that would again require an ongoing network planning and optimization efforts on behalf of the operators. Hence, such unexpected variances within traffic volume during different times of the day or in different parts of the network may potentially cause performance decline (if not properly maintained); hence it may result in the deterioration of the provided QoS.

On QoS issue, the data operators admit that the users’ experience of working with poor quality of internet service is an important reason for their dissatisfaction. The regulator holds the operators and service providers accountable for the provision of low QoS. Hence, the regulator time to time issues ‘show-cause notices’ to different operators in response to the consumer complaints regarding QoS of the delivered services. However, many operators view such repetition of show-cause notices somewhat irritating, as they consider that the regulator is too much getting involved in day to day operational issues without acknowledging the ground facts that the operators and service providers face, which potentially cause for the deteriorated QoS. The operators further argue that the regulator neither understands nor can address the root causes of those macro-economic issues, which essentially hamper the QoS; and neither the operators’ may control those macroeconomic issues. The operators further explain that the currently experienced severe shortages and rising prices of electricity and oil & gas; and thus the rising prices of all commodities, keeping aside the other security related issues, have had severe impacts on the rising OPEX and declining QoS. The operators mention that they are fully aware of the consequences of the declining QoS in the wake of existing fiercely competitive market, but there are certain limitations for operators as well. For example, in the presence of daily 8-20 hours load shedding (power unavailability), the operators cannot run all their sites on DGs (diesel generators) due to the rising cost of fuel and the logistical issues involved in making the fuel available all across the country at different remote locations.

The operators further explain that around one third of their total networks in the metropolitan areas are made up of Micro and Pico cells to effectively support ‘in-building communications’ because of the restrictions on maximum power usage of a single BTS. In order to improve the connectivity and QoS, they need to install these micro and Pico cells, which cannot be operated through using DG backups due to the imposed restrictions by EPA (Environmental Protection Authority) to avoid environmental pollution. In this connection, the operators pose a question for regulator to consider how much noise and air pollution would be produced if the operators install and start operating the diesel generators to run their thousands of sites just within a large metropolitan city for a quarter or half a day on daily basis? These smaller sites are backed up by battery banks (due to their low power consumption requirements) but their backup time is less than an hour. These battery banks are also relatively expensive with shorter life time; hence all these additional costs result to an ever increasing OPEX and decreasing margins accordingly.

The operators argue that the regulator wants to judge the delivered QoS and other operational performance of operators based on the conditions listed in the license agreements, but when those license agreements were being signed, the current scale of power crisis didn’t exist that time and no

one would have ever thought about the current economic conditions and power supply situation. No one expected such a disastrous scale of earthquakes and the recent flooding and its impacts on the country's infrastructure and logistics. No one did expect the worsening law and order situation in the country to the current scale. Furthermore the 'alternative energy' sources were also not that expensive that time. The operators think that the regulator doesn't understand the issue in the broader context to help them resolving those issues that actually cause for the deteriorated QoS.

### *The Fixed Line Services*

In case of fixed line, the poor QoS (including maintenance issues) and the slow responsiveness has been considered among the major reasons for the falling demand of the fixed line services. The currently experienced poor QoS has been primarily attributed to the: lowering investments from incumbent for its network up-gradation, poor maintenance and reparation of its existing copper lines, and the prevailing slack attitude of the fixed incumbent in the absence of facing any competitive pressure. The cellular and broadband operators also view that the QoS problems in fixed line primarily linger around the incumbent's failure in upgrading and modernizing its fault detection and maintenance system in result of cutting down its operational costs through reducing the manpower. As a result, it turned out both in form of delayed responses to the customers' queries and complaints and also a continued deterioration of the deployed copper lines. It has been accused by some operators that the customer complaints were used to be handled so much unprofessionally at occasions that the cable cuts and physical damages were even repaired by the technician using the plastic shopping bags, as finding it a quick solution. It was mentioned that the lack of proper maintenance resulted in further damages to those expensive copper lines to an irreparable level, thus causing 'fault reoccurrence' at the same locations due to humidity and water leakages under the effect of raining and water drainage (especially when located close to the sewerage lines).

The huge maintenance cost of landline network has been also partially attributed to the physical damages caused by the unauthorized, unplanned and careless roadworks or diggings by different public entities and utility companies, as often found working without any prior permission from the relevant authorities. The scale of damages also escalates due to the fact that these roadworks are carried out without having any mutual coordination or collaboration between the different institutions. The operators argue that this lack of coordination eventually leads to a very chaotic and messy situation, causing additional maintenance and reparation costs on top of already rising OPEX in result of enduring these damages to their countrywide deployed copper and optical fiber cables. It has been further declared that the 'damage claims' often do not proceed efficiently against the accused parties due to the fact that mostly they are the government funded public institutions.

Comparing to above presented scenario, in case of wireless operators (including cellular, WLL and broadband wireless operators), the maintenance and expansion cost for the network rollout has been told relatively much lower, since the faults are mostly detected and repaired with modern techniques in quite sophisticated way. Also as a matter of fact the installation of a single BTS provides coverage to a large population located within its cell radius, which makes the connectivity cost for an individual user relatively much lesser than the landline connections. However, in case of

unexpected natural disasters such as the recent devastating earthquake and flooding; the whole cellular infrastructure in the affected areas were reportedly being wiped-out or became inaccessible for the operators (from logistics point of view) to carry on operations in those affected areas for some time, until huge resources were committed again for the re-installation of infrastructure and restoration of routine operations.

When given the example of technologically advanced parts of world with respect to the charged prices and the delivered QoS; PTCL argues that “it is not possible to deliver the same quality and performance of a Japanese-made car when it is manufactured in Pakistan; since the quality is proportional to the committed investment, and investment is proportional to the expected ‘return on investment’, which is eventually judged by the existing demand and the market’s relative purchasing power; hence we should not benchmark our services with the modern parts of the world, since they have less relevance to be compared with our local context”. Responding to the question, whether we can make the business case and create additional value for both investors and users, if the production and assembling facilities of telecom equipment (networks, CPEs<sup>66</sup>, handsets etc.) are made available within the country; PTCL considers that “it is out of the operator’s business scope; hence they cannot respond on others’ behalf since it is primarily the government sector’s responsibility to think about and plan for accordingly”. The fixed incumbent further highlights a fact that there is a new emerging trend among the well-off people to moving out of the city area in order to reside in the city outskirts in newly established residential towns, but this has created a new sort of challenge for the landline operators; thus requiring the deployment of cables out there, in order to provide them access for voice and broadband facilities. However, in the presence of the mounting prices of raw copper, it doesn’t make the business case for the operators to even commercially serve those relatively well-off people, as the incumbent mentions.

### **8.3 The Case of WLL and WiMAX Networks**

This section discusses the case of WLL and WiMAX operations in context of their coverage and access provision across the country, since the two services were essentially aimed at bridging the existing digital divide within the fixed voice and broadband markets respectively. WLL was meant to complement the existing copper lines in the delivery of voice services to overcome the last mile access issue, particularly in case of access provision to distant and uneconomical rural areas. On the other hand, WiMAX was thought to be a suitable broadband access solution for connecting the rural communities with the information world, due to the economic unfeasibility of optical fiber deployment in those far flung areas for broadband access. The following debate highlights the competing translations made by the various market players that would help in understanding the varying perspectives of different stakeholders on that issue.

#### ***The Coverage and QoS Issues for WLL and WiMAX Operations***

In Pakistan, WLL market is only led by CDMA technology (which has been also proposed as the preferred technology in the declared policy). Both WLL and WiMAX operators were given the same license, but in different bands of frequencies namely: 450-479 MHz, 1900 MHz and 3.5 GHz.

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<sup>66</sup> CPE stands for ‘Customer Premises Equipment’

However, 450-479 MHz range has been predominantly used for WLL operations as a complement to the traditional last mile access for the delivery of voice services; whereas 3.5 GHz has been exclusively used for WiMAX operations for delivering broadband services. The 450MHz spectrum for WLL operations has been considered more suitable for the rural areas due to the fact that the lower range frequencies have longer wavelengths; and thus resulting in larger-sized radius of single BTS to cover the sparsely populated areas living in small pockets. The size of radius of a single BTS may vary from 5 km up to 30 km, depending on different variables; such as the operating frequency (due to the propagation characteristics of different radio frequencies), the nature of geographical landscape, number of used RF (Radio Frequency) modules and directional antennas, height of the BTS tower, and data traffic congestion with respect to number of subscribers/sq. km in each direction of sector antennas; hence the radius of a single cell covered by a BTS may also vary in different directions within a single cell (Business Working Group,1999).

On the other hand, WiMAX operations at 3.5 GHz range (SHF band) provide more bandwidth for the provision of broadband services, but then it results in relatively much smaller cell-site coverage of each BTS (practically less than 500m in densely populated urban areas); in addition to encountering an increased susceptibility to signal interference and multipath fading effects, due to having much shorter wavelength, and thus requiring ‘Line of Sight’ (LoS) for distant communications. At these higher range of frequencies, the signals are highly obstructed by different sort of heights and physical objects e.g. buildings, trees, hills, mountains, and, in some cases also by the high voltage transmission lines; hence WiMAX operation at 3.5 Hz frequency seems to be a more suitable choice for delivering higher bandwidth applications to the congested population, generally living in the urban areas in large clusters. Probably, that’s why most of the WiMAX deployments in the country are currently observed within the urban areas rather than the rural areas; for which it was essentially intended for. PTA has awarded WLL and WiMAX licenses with restricted mobility (i.e. roaming only within a single BTS with no inter-cell handover possibility) to multiple operators in 14 different ‘telecommunication regions’ as mentioned in figure 20. These telecom regions have been defined based on the distribution of population in the country. Thus the main aim for introducing these services was the promotion of last mile access in rural communities, especially where the landline access was not considered to be economically a viable option for LL operators.

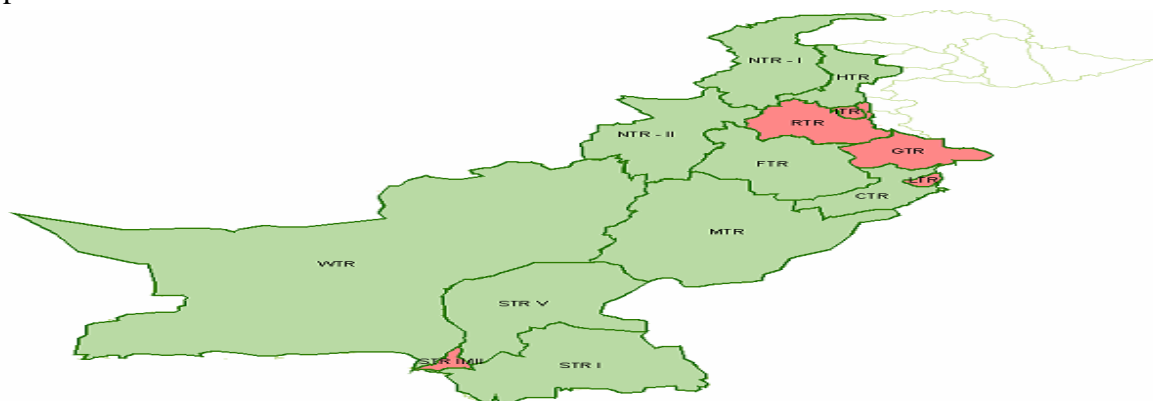


Fig. 20: Telecom regions in Pakistan

Source: Orange (2005)



The above figure shows that currently the 5 telecom regions namely: KTR, LTR, GTR, RTR and ITR<sup>67</sup> (as mentioned with red spots on the map) have been currently focused by the WLL and WiMAX operators. The current pattern of coverage and access provision of WLL operations clearly reflects that the WLL operators (as similar to the case of WiMAX) are primarily focused on densely populated metropolitan cities; instead of achieving the assigned task and the originally intended goal i.e. delivering access to the rural communities across the country. In light of the above line of argument, the role of WLL and WiMAX operators in fulfilling the objective of bridging the digital divide through providing access to rural communities still remains under question.

### *The WLL and WIMAX Operators' Perspective*

From the technical dimension, the WLL operators argue against the current regulatory restrictions on the provision of roaming facility and inter-cell mobility on WLL operations. The WLL operators consider that 'soft inter-cell handoff' is the inherent characteristic of CDMA technology. They consider that the restrictions on handoffs will cause an increased interference; which may result in call drops, call setup failures, degraded voice quality, reduced network capacity, coverage holes and system outages. Furthermore, the phones located at the boundary of two adjacent cells with no handoffs will experience a continuous disruption in service due to 'cell breathing' effect (Orange, 2005).

From the economic perspective, the WLL operators again refute the currently adopted economic rationale of licensing policy. The WLL operators explain that the current licensing regime discourages outside competition against the existing cellular operators since have typically paid higher spectrum fee per MHz, but the regime neglects some other important facts. The cellular licenses were issued based on 'nation-wide' coverage; whereas WLL licenses were issued based on the 'regional' basis. The spectrum fee charged by the cellular operators for allowing them countrywide mobility was US \$291 million for each 13.6 MHz spectrum as assigned to each individual cellular operator; whereas in case of the restricted mobility of WLL operations, the overall license fee paid by the WLL operators was US \$241 million for the total assigned 20 MHz spectrum among all the licensees. It is further argued that the adopted approach in the current licensing policy based on the economic rationale of 'spectrum cost' (i.e. \$/MHz) paid by different operators or access technologies apparently seems to be fair; however, when looking in depth in the spectrum fee issue, the WLL operators indicate towards a specific dilemma in case of Pakistan. The dilemma is that the WLL operators who have the regional licenses for some of the larger metropolitan regions (such as Karachi, Lahore, Islamabad etc.); they have in average paid up to 2.5 times more than of the cellular operators in order to cover those specific regions. Hence, on that basis they argue against such restrictions on WLL operations within those specific regions. They argue in favor of an equal regulatory treatment for all wireless operators in order to assure a level-playing field in a technology-neutral licensing regime.

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<sup>67</sup> KTR, LTR, GTR, RTR and ITR stand for the: Karachi, Lahore, Gujranwala, Rawalpindi and Islamabad Telecom Regions of Pakistan respectively

Hence, in light of the above presented arguments, the WLL operators suggest the policy and regulatory domains to remove the currently imposed regulatory restrictions on their operations that degrade their QoS due to the restricted handoffs (limited mobility); at least at a level within their own deployed network in specific regions. However, they also demand for the allocation of similar frequency range to different WLL operators operating in the adjacent regions in order to facilitate the inter-operator or inter-regional call handover in the future context, if the WLL and WiMAX operators were allowed to provide full mobility across the regions; knowing the fact that internationally the WLL license based WiMAX network has been potentially considered a platform capable of supporting the upcoming 4G services. The operators also demand the assignment of at least 5 MHz block of spectrum to WLL operators (instead of the currently assigned 3.5 MHz bandwidth) in order to facilitate these operators accommodating the future increments in their projected traffic load, especially in urban areas. They further demand that the regulator should clear the assigned spectrum from the unauthorized use of it either by public or private sector entities; in order to avoid interference related issues, which are often encountered due to the parallel use of the same frequencies by unassigned operators for different civilian, commercial and military applications.

Furthermore, the WLL operators also demand for immediately allowing the provision of limited mobility within the regional boundaries, particularly in those rural communities where the current state of telecommunications access refers to a strikingly low teledensity. A figure has been projected in the above cited presentation, as claiming that about 31365 out of total 48368 villages (i.e. 65% of small villages with less than 5000 living habitants) are still without any telecom access (est. 2005). The WLL operators also question the projected growth within GSM subscriptions, claiming that it doesn't exclude the churn factor, and the multiple and inactive number of SIMs; hence they critically argue that the projected numbers do not necessarily reflect the actual teledensity or the increased cellular access to a level as quoted by the regulator & cellular operators. The poor coverage of cellular signals has been also questioned, since as per their claim the cellular signals are still not available in the rural and far flung areas to support an acceptable voice quality.



Fig.21: WLL based Telecom Access in Rural Areas

Source: Orange (2005)

PTCL (the fixed line incumbent that operates WLL operations under the brand name 'Vfone') assumes that the current restrictions upon the extended coverage and mobility of WLL handsets may be the result of strong push from the cellular operators upon MoIT and PTA, since the cellular operators were initially afraid of any potential entry from WLL operators into cellular market; hence considering them essentially a potential threat to their voice revenues. Thus, as a WLL operator, PTCL wishes that the current restrictions on WLL mobility should have been removed, so that the relative charm of WLL usage especially in the urban areas could have been increased. However, PTCL explains that it's not up to the regulator but actually depends on MOIT which is supposed to revise its policy; since the regulator's role is to just implement the delivered policy as a regulatory instrument. PTCL also highlights the issue about the unavailability of WLL handsets in the local markets that could support an extended coverage, due to the undeclared regulatory restrictions on their import; even though legally WLL operators have been allowed to provide coverage within the radius of one BTS (which is typically 5-30 km, depending on multiple factors as discussed above). It has been strongly contested that if WLL mobility within the radius of a single cell has been given provision in the declared policy, then why such undeclared restrictions are being imposed upon the import and availability of those handsets in open markets. PTCL doesn't decline the fact that cellular companies could have been possibly engaged in lobbying within the policy and regulatory domains in order to maintain such restrictions.

However, the author presumes that even if the current ban on the handsets that support an extended coverage is removed, it would only benefit the WLL operators, but not to the WiMAX operators until the inter-cell call handover possibility has been also given the legal provision; due to the fact that the radius of WiMAX cell coverage at 3.5 GHz within densely populated urban areas practically remains less than a kilometer. Hence, for a proper coverage and to support full-fledged voice mobility, the WiMAX operators would need extensive BTS installations, which ultimately demands huge investment; apart from handling the other critical issues like the 'rights of way' (RoW) and dealing with the current restrictions on mobility. However, the WiMAX operators consider that the main hindrance in supporting the full scale cellular voice services for them is primarily not the financial or technological in nature; but more importantly these are the underlying political and regulatory issues, which are difficult to deal with. The WLL and WiMAX operators strongly condemn the policy of restricting their mobility and call handover possibility, since they consider that the technology cannot be restricted and bound on the ground of 'licensing fee' issue; as the rational of optimal utilization of technological resources and 'technology-neutral' policy essentially demand an equal treatment of all technologies. Following this line of argument, these operators favor the licenses to be issued based on the 'beauty contest' instead of being auctioned at huge costs to only limited number of contenders. They deem it critical for the full liberalization of the market through facilitating all the technologies to compete on technological grounds, based on their capability of delivering innovative services.

The author here assumes that the WLL operators would be capable of transferring a substantial number of local calls from cellular networks to WLL networks, if the prices were kept very competitive with relatively good coverage and QoS. The above statement follows the basic

assumption that a significant number of the daily calling log of a common man is expectedly terminated within 30 sq. km radius, especially when the work place is located close to the home. In the above scenario, let's assume even if a quarter of the daily calls were transferred to WLL networks, then it would be considerably a large blow for the voice revenues as currently accrued by the cellular operators; since presently they enjoy their position as the sole supplier of roaming and voice mobility service. If WLL (450-479 MHz) operators were facilitated in providing low-cost WLL handsets and CPEs to support the limited mobility within the restricted (single BTS) range of coverage, then it may presumably help reducing the 'traffic congestion' issue as well, particularly within the metropolitan areas, as currently faced by the cellular operators. Hence it would also eventually help improving the QoS issues, since the overflow of traffic load on cellular networks would split among the two competing networks operating at different frequencies without creating any interference issue for each other. However, the author rather sees a bigger opportunity for the WLL operators in tapping the local voice call markets in the rural areas; since they would have there an apparent advantage over the cellular operators both in terms of the lower prices and the delivered QoS. The author presumes that most of the calls in the rural areas would be generated and terminated within the range of single BTS coverage (i.e. within 30 km radius); hence there they would have no issue with respect to the imposed restriction on their inter-cell call handover facility.

It was informed that many businesses prefer to use wireless-based corporate intercom service to save their costs using WLL based solutions. The author here further presumes that as the market will gradually grow for WiMAX and WLL services, the cost for CPEs would also expectedly drop down significantly, and that would further help meeting the affordability factor. Once the basic affordability level is met, it is expected that these wireless networks may play a significant role in the access provision for both the voice and broadband services; thus it would also greatly help bridging the digital divide both in the yet un-served rural and under-served urban areas.

### *The Cellular Operators' Perspective*

The cellular operators argue that WLL is considered to be a useful and complementing access technology if the WLL operators remain focused on expanding the telephony services to the far-flung areas and connecting to those rural communities where currently the landline access doesn't yet exist. However, WLL has been partially considered a threat to the strategic interests of cellular business if the WLL operators increasingly focus only upon the urban areas, which have been already facilitated with the access provision; with no need left for additional network deployments and new entries in the already crowded voice market. Nevertheless, the cellular operators do not consider the WLL operators a potential threat for their voice business, since the relatively slower growth in WLL operations over the past few years has considerably relieved the cellular operators from the initially felt fear that WLL may significantly erode the cellular business in urban areas. Since WLL only offers a limited mobility within a single BTS radius; hence the cellular operators consider that it can never be a substitute for the mobile service. Secondly, the GSM handsets are available in the country quite easily and at cheaper price than of the WLL handsets. Nevertheless, the cellular operators insist that the regulator should not have issued WLL licenses for the access provision in larger cities, where the access has already been provided sufficiently by the cellular and

wireline operators both for the data and voice services; since the prime objective of WLL is to provide access to the distant and far flung areas. However, the cellular operators inform that some of them also have LL, WLL and LDI licenses in addition to their cellular licenses in order to reduce their excessive dependence upon the fixed incumbent; particularly for the call origination and terminations at the local loop level, which is currently controlled by the incumbent. Hence, they hold these local loop licenses as a strategic measure in the future context, if they were required to install their own WLL network, especially in the large metropolitan cities to avoid the interconnection issues. Hence, WLL has been considered a strategic investment from the cellular operators' perspective as well, as they aim to get independent of the incumbent in future for the call origination and termination at the local loop level.

The cellular operators blame PTCL and other WLL operators for breaching the regulatory restriction on WLL mobility. It has been informed that the cellular operators unanimously filed a complaint to regulator against such ongoing regulatory breaches; however they mention that despite the regulator's warnings, these practices have not been yet stopped. The WLL operators were accused of providing city-wide roaming service (with call handover facility over many BTS) in the large metropolitan cities for a very nominal charge like Rs. 5 per day, which practically works just like a mobile service, as further explained by the cellular operators. It was told that despite these legal violations and regulatory breaches, the WLL operators couldn't achieve yet any substantial commercial success in terms of the number of subscribers when compared with the cellular case. However, in terms of the revenues, the WLL operators have better ARPU despite their lower prices when compared with the cellular services, which actually also reflects relatively much lower costs of operations in case of delivering WLL services, as further informed by the cellular operators.

On the case of a disappointingly slower diffusion of WiMAX services in the country for some years after its launch, the cellular operators referred to different reasons for that. It has been informed that the pioneering WiMAX operator has had tough time and it has been fighting hard for its survival. The vendors and cellular operators explain the case further that the relative failure in case of the WiMAX diffusion could have been attributed to three major reasons: first, the way its business operations have been managed so far particularly during the network procurement; secondly, the way it has been rolled out without having properly followed the gradually planned phased programs for such mass scale deployments; and thirdly, due to the way the WiMAX services were initially introduced all at once at different parts of the country without adopting the 'market segmentation' approach. The phased approach was considered significant for any product's success, in order to first carefully read the critical market's response through a trialed diffusion in gradual steps; so that to achieve the product's maturity over the period of time through learning from the earlier mistakes before going for a full-fledged launch. The cellular operators further elaborate the other reasons for an unexpectedly slower diffusion of WiMAX services as referring to the poor quality of the delivered services in terms of connectivity, coverage and the delivered data rate, when compared against the higher prices charged for these services without having created any appetite and demand for the broadband services among the general public. It has been further told that the leading WiMAX operator has been failed in its network optimization as well. WiMAX could not match in

any capacity the general public's perception and expectations about this service, especially when compared the way it was marketed and promoted through aggressive media campaigns. In comparison to WiMAX, the cellular operators consider the other competing broadband wireless service 'EVO' (or EvDO) relatively more promising, primarily because of its mobility feature; since instead of being connected to a fixed modem or CPE (as in case of WiMAX), it uses a USB stick to connect the terminal (e.g. laptop) with internet and remains connected even while roaming in a car.

However, the cellular operators consider WiMAX a potential threat and a possible competitor in the future context; if these operators were allowed to support the voice mobility and roaming facility as a voice carrier, since currently they are only allowed to operate as a data operator. This is considered technically possible since the 802.16e standard of mobile WiMAX technology is fully compatible to support the cellular mobility for delivering mobile services. Hence, the current barrier is only the regulatory restriction that stops WiMAX operators coming into the voice market. The cellular operators strongly oppose any such consideration based on the argument that "users don't need any additional technologies or networks to support voice mobility in the presence of mobile services, since the cellular tariffs are already among the lowest in the world and a reasonable countrywide coverage has been already provided". The cellular operators further argue that doing business at breakeven point is already a big contribution to serving the social objectives on behalf of the cellular operators. The cellular operators speak in favor of facilitating market 'consolidation' instead of creating further fragmentation and chaos in the voice market through allowing more entries in this already extremely competitive cellular market.

On the question whether the WiMAX and WLL operators would be allowed at some stage to come into the cellular (or the 'voice mobility') market to support the roaming facility as well; MoIT strictly denounces any such idea saying that "there would be no back-end entry in the cellular market, and instead we will follow a 'unified licensing policy' approach, as India is also moving towards it. The huge licensing fee paid by the cellular operators cannot be compared by the licensing fee paid by these operators on the regional basis. Even though WLL has been given the provision to support limited mobility within the range of single BTS in the policy framework; however, this could be an interesting opportunity in the rural areas where the WLL cell radius would extend up to 30 sq. km, but in the urban areas the coverage of single BTS limits to only less 2 to 4 sq. km (in case of WLL operations) which cannot be considered any threat to the cellular business in terms of voice mobility and roaming facility." A leading WiMAX operator disclosed during an interview that if the fair competition had existed in the fixed line market in the presence of a level playing field, the WiMAX operator would have rather considered the LDI operation as more lucrative business than of WiMAX. It's because WiMAX is still in its initial stages of take off and it's unlikely to start paying back until it reaches to the 'critical mass' level in order to generate reasonable returns on investments. The WiMAX operator believes that the 'critical mass' factor cannot be achieved until the vendors come up with substantially reduced CPE prices what is currently subsidized by the operator to make it affordable for the end-users. The equipment availability at affordable price has been considered critical for the product's wider adoption within the consumer market, and here the significant role of vendor is obvious.



There is an interesting point to be noted here. The vendor reduces the prices when there is an element of ‘economies of scale’ present for the ‘mass production’ after assessing the essentially required market demand. However, this essentially required ‘critical mass’ (or the demand factor) cannot be assumed to be achieved until the new product is widely visible in the outlets and also made available at an affordable price. Hence, this clearly refers to the familiar ‘chicken or the egg’ dilemma. Therefore the logical conclusion of this debate demands a joint and collaborative effort on behalf of the vendors, operators and all the other relevant stakeholders in order to create the required level of momentum through creating favorable conditions for the ‘desirable innovations’; and thus to convince the masses to rapidly and effectively adopt the new products.

The author assesses that in the wake of an ongoing digital convergence; there are multiple access technologies that either replace or complement the existing ones. This development has created a strategic shift in the revenue flow, the balance of market power between the competing players; and hence it has also created new competitive avenues for their maneuvering and repositioning within the changing market dynamics. In result, it has created new grounds for the competitive ‘translations’ and ‘interest alignments’ among the market players and other stakeholders. However, the fixed incumbent insists that “despite the emergence of all these substituting, competing and complementing access and transmission technologies; wireline would still remain serving as the real benchmark to judge the country’s telecom infrastructure, and traditionally the landline access has been often preferred over the wireless solution for its reliable and clear communications”. It has been further emphasized that the optical fiber is capable of delivering more bandwidth for supporting the range of existing and emerging broadband applications; whereas the wireless solutions would always have the bandwidth constraint due to spectrum limitations; in addition to have the intrinsic issues related to the ‘interference’. Hence, the author presumes that probably a hybrid solution composing of both the wireless and optical fiber based technologies seems to be the likely future of telecom markets; in order to be capable of effectively addressing the affordability, access, mobility, coverage, quality of service and the bandwidth related issues.

#### **8.4 Mapping Teledensity – Actual Number of Users vs. Registered SIMs**

There was initially no regulatory restrictions on having multiple number of SIM cards, and any need for following a proper registration and validation process until couple of years back, when the government and regulatory authority fully enforced the new regulation about the mandatory registration and authentication of SIM cards in order to ensure the individual privacy and public safety, especially in the wake of current security conditions and worsening law and order situation in the country. Until 2008/09 when the new legislation was about to enforce, the prepaid SIM cards were being sold at each corner of the streets and even at foot paths by layman without following any due procedure for the subscribers’ registration. Under the new legislation, now all the cellular operators are bound to follow strict registration and validation process for issuing SIM cards after certifying a valid computerized NIC (National Identity Card) copy with the possibility to have at maximum 10 SIM cards. However, a recent news<sup>68</sup> reflect that the government has now released an

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<sup>68</sup> <http://propakistani.pk/2011/04/20/issue-only-one-sim-per-one-cnrc-rahman-malik/> (Accessed on August 12, 2011)



order to only issue one SIM to each NIC holder and block the multiple SIMs previously issued to an individual within 30 days, which is a move that has been generally appreciated by different circles.

The author observes that many people did want to keep multiple SIMs even without having any solid reason; mostly just because it doesn't cost them anything extra to have an additional one, since prepaid SIMs were used to be provided so far taken for granted, often with an additional amount of free calling minutes and text messages, without any fixed monthly rent; hence this tendency again validates the concept of 'tragedy of the commons' (Hardin, 1968). The operators accept the need for reviewing the current mechanism adopted for measuring the cellular teledensity, in order to find a logically valid relationship between the existing patterns of teledensity, the different methods used for gauging the overall telecom teledensity, and the allocated resources accordingly. This is imperative particularly when these statistics have been quoted to refer the status of access provision and the scale of existing digital divide in the country for policy debates and analytical purposes.

A recent news in 'Pakistan Times'<sup>69</sup> with reference to the latest published LIRNEasia cross-country survey announces the fact that the ownership of multiple SIMs has been witnessed as a significant trend among the Pakistani customers, especially among the youngsters and poor segments of the society (i.e. 'Bottom of the Pyramid' living under the poverty line). The finding reveals that the number of mobile phone users carrying multiple SIMs has been estimated more than 22.8 million in the overall customer base as it was declared 99.18 million by June 2010; hence the country was ranked highest in the whole region for the largest ratio of the use of multiple SIM cards per user. Another think tank survey reveals that the actual number of subscribers is actually less than 77 million out of 100M cellular base, as further disclosed by the article. Telecom analysts inform that the numbers of subscribers with dual or multiple SIMs could have actually exceeded from these estimated figures, if the users from the middle income group were also included in the survey. The reasons for keeping multiple SIM cards have been primarily attributed to the differential tariffs of different services as offered by the multiple operators, their relative network quality, and the different packages currently offered by the same or different operators. It has been further added that the cellular operators are trying hard to reactivate their idle connections through offering different enticing packages in order to retain their user base.

It has been also discussed that the cellular operators are often reluctant in losing their inactive subscribers' base; and they avoid disclosing their actual user base in front of the media and regulator, in order to maintain or improve their market image. However, this increasing trend of keeping multiple SIMs by a single person in the presence of prepaid regime raises serious question about the need for differentiating the actual number of 'users' from the registered number of SIMs or 'subscribers'; since it is the number of issued SIMs and not the actual users, which has been used for benchmarking the cellular teledensity in the country. The cellular operators themselves assume that the actual number of active users would be around 60-70M out of 100M subscriber base (est. 2010). This estimated figure of actual number of users resembles to what the author himself has

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<sup>69</sup> <http://www.pak-times.com/2010/12/18/pakistan-has-highest-number-of-multiple-sim-users-in-south-asia/>  
(Accessed on February 12<sup>th</sup>, 2011)

estimated based on the data collected from field research, which reflects that the ratio of keeping multiple SIMs in Pakistan is 1.63; hence referring to the presence of around 67M actual users (out of the total 109M subscriptions, est. June 2011). However, the ratio may slightly vary, considering the fact that the current survey largely includes the students with a median age 21 years, who are expectedly more price-conscious and relatively more informed users about the most effective use of different packages, as currently offered by different operators.

The operators in general agree on this proposition that teledensity ratio should have been mapped using the actual number of users, and not based on the number of registered (issued) SIM cards. It is assumed that it would provide a better picture of the current status of actual teledensity in the country. If we accept the above perspective on mapping the teledensity, then some interesting results may appear out of the analysis. For example, 6.2 million fixed line household connections would mean providing access to about 37 million people (assuming in average 6 persons living in each household making use of the household connection). Another example would be of public payphones (PCO) and phone booths, which are about 400,000 (est. 2009) currently installed whole across the country; hence if assuming 100 persons of a community having access to these publicly accessed shared-mode terminals then it may be expected that these terminals basically provide access to around 40 million people. There is another line of argument as well that debate this issue from even a broader perspective; hence demanding for the inclusion of impact analysis also for the policy debates, while gauging the current status of teledensity from the access provision point of view. Thus, it becomes also a public policy issue; whether the public resources have to be deployed for the public benefit in terms of the resulting impacts and relative usage of different ICT services, or merely for achieving the growth and declared benchmarks only in terms of statistical numbers; even though if the numbers do not reflect the reality?

### ***Increasing 'Churn Rate' and Lowering Customer 'Loyalty' – Prepaid vs. Postpaid Regimes***

The cellular operators are also battling with the challenge of increasing 'churn rate' and the declining customer's loyalty with any specific brand of operator. The main reasons identified for that negative trend from the operators' perspective is the availability of multiple offers and attractive packages from different operators, in the presence of prevailing 'prepaid' and MNP regimes. The customers are observed behaving opportunistically to get maximum benefits out of all the offers and different packages as currently available in the market without showing any loyalty to stay connected with a single network. It is relevant to mention here that cellular operators pay the 'activation tax' and 'annual spectrum fee' to the government based on per user increment and the total user base, which is measured by the number of issued SIM cards. This leads to an increasing amount of costs endured by the operators both for the customers' acquisition and retention. Hence, eventually this trend results in a reduced ARPU, especially when there are significant number of inactive or idle SIMs or a higher 'churn rate'; thus leading to a further reduced profit margins accordingly. The cellular operators consider the trend of keeping multiple SIM cards and the increasing churn rate as a very unhealthy and counterproductive sign from the operators' perspective, since it creates uncertainty, instability and chaos in the market.

The operators are found increasingly offering the ‘gift economy’ sort of packages to grab the market share, particularly by targeting the youth market segment (15-35 years old) which essentially composes 60% of total population, thus making a significantly large majority of the total cellular and broadband subscriber base in Pakistan. Unlike the dominant trend of the developed countries where supposedly more than 90% users have the postpaid subscription; on the contrary, here around 95% users have prepaid subscriptions. The primary reasons for keeping the prepaid connections have been mentioned as: the user’s control over its spending on telecom services, lack of trust on billing transparency, and to avoid paying any deposit or the monthly line rent which is required to be paid in case of having postpaid connection.

Hence, in order to gain the customers’ trust and to restore their confidence over the postpaid regime, and to increase the customer’s loyalty and reduce the churn rate; the author here proposes three immediate strategies to be adopted by the operators. First strategy would be to significantly bring down the initially required amount of ‘security deposit’; in addition to lowering the monthly line rent as well, at least for the first two years of postpaid subscription to retain the customer loyal with an operator. The second move would be to take additional measures in order to introduce more transparency and clarity in the billing system that should make the things fully explicit and visible to the customer; so that to gain the customer’s trust and confidence over the operator and its billing system. One such possibility could be to send billing updates on weekly basis through SMS to the subscribers (without taking any additional charges for this service) and to also updating these details on the users’ accounts at the operator’s website. The third strategy would be to offer additional financial incentives and psychological privileges for the postpaid customers, by providing both the basic and value-added services at much competitive prices than offered for the prepaid customers.

In case of withdrawing the postpaid ‘security deposits’, the operators may adopt alternative mechanisms to ensure that the users won’t escape without paying their dues to the operator. For example, the operator may ask the postpaid users to agree on a payment arrangement, where the users’ monthly bills would be automatically paid through their accounts in a bank on a fixed date of each month. The other possibilities could be to make these monthly payments as part of the other utility bills (e.g. electricity, gas, water, taxation etc.) by signing a contract with those utility companies after agreeing on some mutually beneficial terms and condition. An example of such type of bill collection is the current reception of TV fee from the viewers through making it part of their utility bills. The online account is also highly recommended to be established for all the customers in order to facilitate them checking their account balance, changing their current subscriptions (or packages), and for topping up their account balance online. It is expected that the adoption of above recommended strategies would help operators in increasing their customers’ loyalty and reducing the currently high ‘churn rate’ through establishing the postpaid regime; and by strengthening the relations with the customers with the help of different trust-building measures, as recommended by the current author in the above passages.

## 8.5 The 'Demand-Side' Economies of Scale through Market Awareness & Content Development

So far we have been talking about the 'supply-side' economies of scale, but it is important to also understand the critical importance of 'demand-side' economies of scale. The supply-side economies of scale is achieved when a firm receives mass production orders in a scale where its production capacity is optimally utilized; in result the 'marginal cost' of producing each additional unit significantly drops down that helps creating additional profit margins for the producing firm. This is good enough; but the real dilemma in the success of an innovation is actually to create that desired scale of demand in order to pave the path for the mass scale adoption of that particular innovation. In the industries like telecommunications, the most prominent feature that distinguishes it from rest of the industries, especially when looking at the demand-side market dynamics is the presence of a high level of 'networking effect' and 'positive feedback' under which the demand for an innovation may increase by multifold in a quite short span of time, if the targeted market is properly made aware of the real worth and value of the innovation within its local context of usage. When considering the local context of the targeted market, then the significance of developing the relevant applications and useful contents in line with the 'absorptive capacity' of the targeted market becomes evident. The developed contents and applications then have to be both in line with the users' actual needs and competencies, but also in line with their social values and cultural contexts.

In Pakistan, there has been found so far no significant role or any acknowledgeable participation from the 'content providers', either as 'content developers' or as 'content aggregators'. However, there is an acute need felt for bridging this gap, particularly in case of broadband and cellular markets; since the cellular and broadband operators eagerly look for the growth of content development industry. There is a growing demand for the useful and relevant contents and applications, tailored to the specific needs and requirements of the local communities within their local languages. Hence, the common call is for an active and productive role of 'content providers' in the local telecom market; either working as independent entities or like 'associates' of different telecom operators, as being part of their value chain. The author also considers that for the successful adoption of a new technological product or service; the new product has to pass through the 'perceptual transition phase' i.e. the transition from initially being perceived as an 'exotic' product to a phase when it is eventually perceived as an 'embedded' product in the daily life context, as we have witnessed in case of other technological products, including the mobile phones.

The academia and CCP also acknowledge the missing role of content providers. The academics highlight the need for such 'content aggregators' who could organize all the scattered information available on the internet as per the requirements and the competencies of each group of users. For example, from the academic perspective the need is felt that an aggregator should have properly organized a list of relevant web-links in order to facilitate the academic researchers in finding the required and selected information from those well-categorized lists of websites. The academia considers that URL ('Uniform Resource Locator' or the 'web-addresses') and email addresses have the same value in accessing a virtual location within the cyber world, as the phone numbers and physical addresses have the importance in finding a physical location. Such an arrangement of a

‘URL directory’ should resemble to a telephone directory, where any organization could be easily traced out. An example of such a categorized scheme has been referred by the author in appendix 3.

### *The Role of Public Sector*

It has been argued by many corners that the growth of internet is tied with the effective development of useful contents and relevant applications, and also with the public’s easy access to those developed contents and applications; so that to create the appetite (need) and demand for internet usage among the general masses. However, most of the respondents realized the fact that government needs to stimulate and facilitate the creation of ‘demand-side’ economies of scale. The government has been asked to help raising the demand and appetite for the telecom services by first starting with the public sector itself. Hence, the government should implement and enforce the effective use of different e-applications; such as e-governance, e-education, e-banking, e-medicine, e-ticketing and e-commerce applications. In this regard, the academia insists that at the first stage all the relevant data and operations of public institutions, which are considered relevant for the general public access, should have been made available online; in order to both facilitate the general public and also to promote the ICT culture within those public institutions. It has been further argued that the public institutions should have been compelled to fully implement and adopt within a given timeframe the e-governance structure and e-administration practices for their data handling, information sharing and performing daily activities. However, this also requires the implementation of well-secured and encrypted online processes to enhance the system’s security and robustness. In the second phase, the private institutions, businesses and organizations should also be given a clear timeframe for the implementation and effective adoption of online processes and practices.

However, the operators consider that there have been no serious initiatives taken so far by the public sector in this regard. The public sector has been making time to time some announcements about the commencement of e-banking, mobile banking, e-education and e-government initiatives; however, in reality the relative impacts of those documented initiatives have not been yet practically acknowledged or observed, apart from some cosmetic changes in the office environment. The academics indicate that many public departments and ministries have not even yet properly managed and elaborated their websites to be accessed for the useful and relevant data in context of a common man’s perspective. Most of their websites have been called very static, outdated and even not fully functional. Thus their websites are required to be made more dynamic, interactive and constantly being updated. In this context, the immediate task particularly for the public sector’s institutions is to make visible their web presence through uploading all the relevant databases on their websites, and also making those uploaded contents and applications available for the general public through an easy mode of web-interface; so that their online visibility is acknowledged.

In the above context, the regulator claims that it actively screens the best practices across the globe, particularly in the neighboring countries that have similar background such as India, Bangladesh and Sri Lanka; in order to get lessons and inspirations from their experiences to be effectively adopted within the local context. PTA informs that different initiatives have been taken in this regard and they are at different stages of development. MoIT also informs about its initiative for

promoting telemedicine (e-health services) by e-linking the different hospitals with each other. Furthermore MoIT informs that it is taking steps towards effectively implementing e-government, mobile banking and e-commerce relevant services. MoIT realizes the fact that through the provision of useful and relevant contents and applications, the market appetite and demand for the use of ICT services could be aroused. MoIT further argues that the provision of local contents within the relevant context of rural communities should not be considered under the social obligations, but it would also have obvious implications for the earnings of the respective operators. MoIT shows its strong will to bring all the stakeholders for a larger scale initiative in order to address the 'content-deficit' issue, which would not only help in bridging the digital divide, but would also help companies to overcome their current concerns regarding the depleting ARPU and shrinking margins. In this regard, it has been recommended that the ministry should lay down a clear policy vision and a viable framework in agreement with the other stakeholders.

### *The Role of Operators and Service Providers*

Based on the observations, and an extensive communication with a large group of respondents, it is realized that the slow diffusion and adoption of internet services in the country is primarily due to the fact that internet has not been effectively marketed, and the genuine needs and requirements of the masses have not been properly understood. It has been basically considered a collective failure of the internet service providers, including the broadband and cellular operators. This is because they have been apparently failed in convincing the mass markets to feel the need for adopting internet as a 'way of life' (not in terms of 'style' but as an 'instrument'). They were required to create the desired appetite through effectively projecting its productive and relevant usage in the specific context of targeted communities. They also seem to have failed in addressing the social concerns (including the moral and ethical issues related to the use of internet), and properly acknowledging the prevailingly conservative values of society. Since the mainstream market and its genuine concerns were not properly addressed; hence their interests could not be aroused and stimulated accordingly. For example, the parents were not made fully aware of the positive and productive features and applications of internet; hence they couldn't be convinced enough to have confidently adopted this technology within their living premises. Furthermore, it has been observed that most of the parents had already nourished some sort of 'preconceived notions' in their perception, even before having experienced using internet themselves; due to the lack of familiarity with the ICT gadgets or being preliminarily warned by others about the potential negative usage of this technology. Hence, due to the failure of internet suppliers in developing a positive image of internet with the help of effectively running 'awareness campaigns'; most of the parents feel threatened by the induction of this technology in their homes, thus already get engaged in an adversary relation with this exogenously 'imposed' technology.

Most of the parents were found highly unaware of any productive use of internet, in terms of facilitating their daily life activities. They simply didn't understand how internet could have been used for their social, political, educational and economic empowerment. As a 'test case' they were exposed to some interesting applications and websites such as online video streaming for different useful and interesting contents available at some content aggregator's sites e.g. a big collection of

dramas, songs, movies, sport events, live TV channels, talk shows etc., besides the other interesting applications such as the online news papers, Google Earth, different search engines, encyclopedias, e-banking, e-commerce, e-ticketing, online libraries with huge educational data resources, professional networking sites (e.g. LinkedIn), and video conferencing facilities e.g. Skype (all for free!). The outcome of those experimental exposure and awareness sessions was observed simply amazing; as the author found considerable change in the perception of the test sample after those sessions, which resulted in a firm commitment and strong desire for soon adopting internet for their kids and for themselves. Hence, it is concluded that the issue is not just about making sure accessibility, connectivity and affordability; but actually the biggest issue in the author's point of view is the availability of the useful contents and relevant applications in addition to the proper projection and marketing of internet; in order to reconstruct the damaged image and to create the desired appetite for the service.

The regulator considers that the operators need to play their significant role in that context by developing local content and relevant applications in collaboration with the content developers, in an easy format by effectively utilizing the web portals, TV documentaries, and arranging training sessions or workshops. The mobile incumbent explains that it runs its own educational and awareness campaigns by reaching to the far flung areas of Pakistan to convince the people that there is no such harm in using mobile phones to curtail the widespread myth among the people that its use may cause any health hazard. The mobile incumbent insists that the mobile operators strictly follow the international standards set by ITU; and in addition to that the regulator and other environmental groups are also quite vigilant on this issue. The operator further argues that there are no such cases yet in notice where fatalities would have occurred due to the mobile phone usage in result of any potential harm to their health. Conversely, the cellular operators encourage and promote the usage of mobile phones in their mass campaigns; while highlighting its different interesting and useful applications, and the positive impacts on our life.

In the above scenario, the broadband operators however do not accept the responsibility for content development, while taking support of the same argument as passed by the fixed incumbent, that the operators are not assumed to develop contents as they do not consider it part of their business model; since they only provide the access and the medium (transmission channel) for the delivery of contents. Hence, they consider their role ends at laying down the pipes (and installing the towers) and then they cannot take further responsibility what data flows through these pipes; or in other words what content is delivered through these access and transmission lines. They consider it the role of 'content providers' to fill their pipes with the desired contents, but apparently that model is unlikely to work particularly in context of Pakistan because of witnessing an ineffective role played by the content developers so far.

Nevertheless the author foresee that it is where the gap actually exists, which doesn't help creating the 'value' from the user's perspective; since the user is unaware of and actually not concerned with, who delivers what part of the value in the total 'value chain'. The end-user is primarily interfaced with the service provider (an ISP or operator); hence the user's all expectations and the



developed image about the delivered service mainly are built on its interactive experience with the final product offered at its premises by the ISP or any other operator. The user remains largely unconcerned and unaware of any role for the ‘content provider’ the way it has been delicately demarcated by the operators. Hence, any disappointment that may cause due to the delivered contents would first and foremost ruins the operators’ image in the customer’s eye; in addition to the developed bad image and distorted reputation about the experienced service in its perception. It is as simple as the case where a water utility company cannot simply get rid of its responsibility for the delivery of clean water, by just saying that its part of obligation is to just install and give access to the pipelines; whereas it remains the third party’s responsibility to deliver clean water through the installed pipelines.

The author further insists that the operators and service providers should design their business models when looking from the user’s perspective (i.e. designing ‘user-driven’ business models led by the demand-side economies of scale); instead of getting obsessed with the predominantly technology-driven and supply-led business models. It is because, in this new era of digital convergence, especially in the networking industry; no one remains isolated in its operations and thus unaffected from the actions and operations of the other players who partially control the other parts of the value chain. Hence, it is strongly argued here that the whole value chain and their controlling elements have to join their efforts in order to create a collective ‘value’ and favorable image in the user’s perception, in addition to the desired effects for the end-users; since their doom is connected with each other either in case of success or failure. Therefore, the three layers of the business value creation i.e. the basic technological platform, services platform, and the delivered contents & applications have to be well integrated and finely tuned with each other to create the desired and real value for the end-users.

The slow growth of broadband internet services has been generally referred to the lack of awareness (unfamiliarity with the useful and relevant contents and applications) and the lack of computer literacy among the masses (inability in using computer and internet applications). The general masses are largely unaware of the very basic essence and the relevance of internet in connection to their lives, and they simply don’t understand how this service can be useful in their socio-economic context (which refers to the presence of ‘application barrier’). Secondly, even if they get familiar somehow to some of the useful internet applications, then they get stuck with the issue of the lack of competence in properly and effectively handling computer and internet itself, and using those developed applications on their ICT gadgets and devices (which refers to the presence of ‘technological barrier’). The regulator also acknowledges the fact that the existing market is still unprepared for the adoption of broadband services, and it will take some time before the market is educated enough to properly understand and give value to the broadband services. It is also acknowledged that the general masses are required to be sufficiently trained with the basic ICT skill; so that they could effectively operate the computer and make use of different internet applications. However that could only be realized through a joint effort and launching a large scale initiative among the market players and important stakeholders. The author here assumes that as the application and technological barriers would gradually reduce, the product’s usability is also likely

to increase. The regulator and media agree on the fact that the relative capability of the users to effectively consume (or effectively use) a particular telecom service actually defines its expected scale of diffusion (both in terms of the rate and depth of diffusion) among that targeted groups of users. In that context, the relative difference in the mass awareness and scale of usability seems to be quite high when compared the mobile and internet services; and hence the relative difference in their scale of diffusion accordingly. In case of fixed telephony, the elements of simplicity, awareness and usage skill sufficiently do exist, but the elements of ‘need and relevance’ are increasingly diminishing, especially after the widespread diffusion of mobile services. However, there are also other critical variables that need to be identified and effectively addressed, which are apparently slowing down the diffusion of fixed line services.

## **8.6 Value-Added Services (VAS) – A New Base for Competition**

The term VAS (value-added service) has no standard definition and the term conceptually varies with time and the specific context of its usage, as per the ongoing technological and market developments. For example, at one time the CLI (Calling Line Identification), call forwarding and SMS services were thought to be important value-additions within the voice telephony market; but now these services are not considered value-added any more in terms of ‘product differentiation’, since these services have now become integral part of the fundamental features of the least acceptable level of mobile service. However in Pakistan, SMS is still considered as a value-added service, since it is an unsaturated market and the operators seek for new streams of revenue from the text messaging service. The term VAS has been generally understood as synonymous to the data services in Pakistan, particularly in the cellular market. Hence, VAS has been broadly referred to highlight any value-added service that is commonly provided under special terms and conditions; hence excluding the standard voice service, which is provided at normal rates under the general terms and conditions. For example, if an operator introduces a ‘medical consultation service’ on the phone, then it would be considered as a VAS since the service is accessed through dialing a specific short-code number, which is often run on different rates and under different terms & conditions, as compared to the general voice call. Hence, VAS opens up a new market niche, for the operator to generate a new source of revenue. In this context, the author recommends to the operators to not feel threatened by different emerging technologies, even out of their existing portfolio; instead they should consider these emerging technologies (such as VoIP) as potentially a competitive and viable solution for creating new streams of revenues and business opportunities in the future context.

Therefore the term ‘VAS’ should not be considered necessarily just in terms of value addition through data services, but it could be essentially any new value addition; whether voice or a data service, that a ‘customer’ actually perceives as an ‘added-value’ within the delivered or its subscribed service. VAS increases the customer’s willingness to pay for a subscribed service, which means that the customer considers it ‘worth’ to be subscribed for. An example of value addition within data communication was referred by the broadband operator that if an operator only provides data connectivity then there is no value addition; however if it also offers an additional service to its clients to download a free of cost licensed version of antivirus program from its server, then it would be considered as a value addition from the user’s perspective.

The cellular operators realize the negative impacts of an ongoing ‘price war’ in terms of declining profits, due to the lack of differentiation among the competing services as currently offered by the rival operators, which essentially discourages any further investments in the mobile sector. To combat with this negative trend, operators understand the need for moving the basis of competition from price-led rivalry towards value-added services (VAS) in order to generate new sources of revenue by exploring this yet an untapped and relatively unexplored market. The cellular operators elucidate that relatively the bulk traffic is still generated from the voice traffic, which currently contributes around 90% of the total revenue; whereas the share of VAS and data traffic volume (including SMS, MMS and mobile internet) is still less than 10% (est. 2010); although its share in total revenue is expected to substantially increase in the near future.

The operators increasingly acknowledge the importance of relocating their position in the competitive arena by adopting the ‘blue-ocean strategy’ in order to explore new business opportunities and innovative ideas; rather than being trapped in the prevailing ‘red-ocean strategy’ which engages the rival operators to fight for each penny in an already exhausted market. Thus, in light of the above discussions, VAS should be considered as “any innovative service that adds value on top of the basic services, which may essentially help the operators to increase their ARPU and thus their profit margins accordingly”. The broadband operators also acknowledge the fact that they are now considering VAS as a potential source of revenue, and a way to distinguish themselves as an innovation-led company whose focus is upon the ‘value creation’. The operators now realize that the real value has to be perceived from the customer’s eye and not from the supplier’s perspective.

The author considers that in order to bring this balance between the ‘market pull’ and ‘technology push’ dimensions during the product development and its diffusion processes; the companies need to focus on creating ‘interactive loops’ and ‘occasions’ where the whole range of different expertise and competencies belonging to different departments could get engage with each other; and also with the targeted groups of customers through the effective use of ‘focus group’ sessions. These occasions of interactions should not be just restricted within the formal settings, such as through meetings, workshops, and training sessions; but in fact these interactive occasions need to be also composed of the informal moments, such as at breakfast, coffee break, lunch, picnic, and during different other social, sports and entertainment activities. The aim of all those cross-functional, inter-disciplinary and inter-departmental interactions among multiple stakeholders and wide range of competencies is to provide venues and opportunities for the participants to learn from each others’ competencies, specifically used terminologies, differential codes of conduct, and varying approaches towards addressing different issues and problems. The interactive learning that would take place through these interactions are expected to help the participants better understand each other’s translations and interpretations; in order to create ‘synergy’ out of this productive diversity. In result; these interactive occasions would encourage and facilitate the development of new ideas and possibilities for effectively addressing the current and future challenges.

The operators acknowledge that the VAS providers and content developers need to be fully encouraged by both the established telecom suppliers and the regulator. They also acknowledge the

fact that the operators and vendors (equipment suppliers) have been themselves essentially turned into ‘system integrators’; in which many ‘solution providers’ actually contribute at each part of the value chain. They fully realize that the operators alone cannot do all this content and VAS development on their own; hence, they need the engagement of ‘third parties’ for the VAS and content development. In this regard, the operators understand their responsibility for drafting the relevant proposals and consultation papers for MoIT, PTA and other stakeholders in order to stimulate this process. One large mobile operator informs that it has plans to regularly organizing ‘VAS Ecosystem’ conferences in order to discuss these issues on that platform.

### **8.7 The Projected Future Trajectories of Different ‘Access’ Technologies**

The respondents projected different trajectories for various access technologies but there were many common elements among their projections; hence it is possible to visualize an expected pattern here. The future of existing copper infrastructure in the country has been commonly viewed as quite bleak by most of the respondents, including the fixed incumbent itself. They expect the copper lines would eventually become obsolete in future in result of their gradual replacement with the fixed-wireless (WLL-based) access solution for the ‘last mile’ (sometimes named as the ‘first mile’) to deliver the voice services. The author expects that WLL would have the ‘cannibalizing effect’ on landline copper network, and it is highly expected that the future expansion within fixed line networks would essentially utilize WLL technology.

On the other hand, the currently deployed copper networks would be primarily used for the provision of relatively low cost xDSL (either ADSL or SDSL)<sup>70</sup> solutions with supporting a moderate data rate up to around 1-2 mbps in the practical conditions (considering the deteriorating copper line condition in the country). The targeted customers for this service would be then the comparatively average income customers living primarily in the urban areas, where the copper access lines are already available since there is assumed to be no further expansion in the currently deployed copper networks. The DSL popularity and its relative diffusion may significantly grow if the fixed incumbent reasonably drops down the prices around up to the half of the current prices without compromising on the QoS, considering the presence of a high degree of ‘price elasticity’ in the broadband market. As recommended above, the incumbent may also withdraw the monthly line rents on the fixed line subscriptions for a definite period (say for 2-5 years) in order to optimally utilize its copper networks. The author expects that it may considerably help in achieving the desired ‘critical mass’ for the incumbent both in the fixed line and broadband markets; since it would not only increase the traffic volume but also help in making an effective use of the remaining half of the idle copper network, which has been currently left redundant without any proper utilization, either for the voice or data services.

On the other hand, the broadband wireless (WiMAX and EVO) and the Optical-fiber (FTTH and FTTB) would expectedly remain relatively higher-end access solutions in terms of affordability for delivering the mobility and bandwidth respectively. However, the diffusion of these services is unlikely to achieve the ‘critical mass’, until the prices are dropped down significantly under the

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<sup>70</sup> ADSL and SDSL stand for: Asymmetric Digital Subscriber Line; & Symmetric Digital Subscriber Line respectively.

competitive market pressure; as the market awareness and appetite would gradually grow over time. The author presumes that until that happens, these access solutions are not expected to diffuse beyond the selected segments of urban communities such as the technology enthusiasts (e.g. the college and university students), corporate users and relatively well-off residential customers, who are generally more conscious about the 'mobility' (connectivity with their portable devices) and 'quality of service' to support their high speed interactive broadband applications. Just recently, Pakistan has launched its first communications satellite PAKSAT-1R into space<sup>71</sup> which will be primarily used for broadcasting, telephonic and data communications purposes. This initiative will open a new era for the satellite communications in Pakistan, and it will enable the delivery of high speed satellite based broadband internet service to each corner of the country. However, the real benefits of the satellite access based telecommunications services would be realized only when the operators would start offering competitive offers, within the economic reach of a common man.

It has been further envisioned by the respondents that in future most of the voice traffic including the local, NWD and international calls would be largely transferred to the cellular networks due to their offered mobility, relative convenience, portability and extremely competitive calling rates as compared to the fixed line. However, the relative share of outgoing international traffic volume on the VoIP network is expected to grow quickly as the corporate sector is now gradually switching to IP based PBX (Private Branch Exchange) systems both for their intra-network and outgoing international calls, considering it a more cost effective solution. The volume of grey traffic is unlikely to be curtailed until the current ASR and APC rates are dramatically brought down. The current regulatory barriers upon the usage of VoIP technology (IP telephony) may cause a partial delay, but such barriers can never stop the diffusion of this technology for an indefinite period of time, since Pakistan cannot afford any longer to remain an isolated island in this increasingly connected communication world.

The fixed incumbent views that the public and corporate sector would still prefer to have landline connections in their offices, primarily due to the fact that fixed line provides relatively better connectivity and voice quality. As compared to the relatively clear and reliable communication as experienced in case of landline connection, the mobile service in Pakistan has been called still suffering from the issues like the poor voice quality, weak signal strength, low coverage, frequent call drops, and interference; that the public sector, particularly the corporate customers cannot afford to bear for their official communications and correspondence. Furthermore the author presumes that the fixed line communication access also becomes the desired solution, when the communication need is thought to be more 'location-specific' than 'person-specific'. In addition to that many government organizations, security agencies, utility companies, educational and health institutions, and especially the banks generally require the landline number of the calling parties in order to verify the calling or the called-person's identity through fixed-net. On the other hand mobile primarily serves the 'person-specific' and 'mobility-led' communication requirements.

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<sup>71</sup> <http://telecomnewspk.com/2011/08/pakistan-launches-its-communication-satellite-paksat-1r/> (Accessed on 12 August 2011)

## 8.8 The Broadband Traffic Volume and International Connectivity

As per the regulator, in the year 2005, the broadband user base in the country was just 15,000; however, by March 2011 the total number of broadband users reached to 1.4 million, as consuming above 60 Gbps of bandwidth. To connect this generated traffic volume with the outer world requires massive planning and investments on behalf of the telecom suppliers. So far we have discussed the telecom infrastructure within the country for handling the local traffic; however it seems relevant here to also briefly discuss the country's international connectivity with rest of the world. Currently, the existing installations for satellite connectivity have been considered insufficient to support the current and emerging bandwidth requirement for the whole country; in order to replace or even support as backup solution in case of any major defect in the deployed fiber connectivity. This issue has been discussed in the previous chapter under the 'control over essential facilities' within the PIE section. Recently, Pakistan has launched its first satellite into space which essentially aims at fulfilling the future communication needs of the country, and to also provide the backup support in case of facing any interruption in the undersea fiber cables for international connectivity. Hence, these are predominantly the undersea (submarine) fiber cables that currently connect the country with rest of the world. At this time the country makes use of two international fiber carriers owned by PTCL and TWA as explained below.

The PTCL fiber links are connected with the international optical submarine telecommunications cable SEA-ME-WE 3/4 (South-East Asia - Middle East - Western Europe 3/4), and it is known as the world's longest cable (with 39,000 kilometers length)<sup>72</sup>. It is operated by India's Tata Communications, with stakes involved of 92 other investors from the telecom industry. The second international carrier TWA (Transworld Associates) is originally a local company with major shares of OT (Orascom Telecom) in it; hence, it can be considered a sister company of the mobile incumbent. TWA operates the 1,274 Km long TW-1 fiber link that connects Karachi (Pakistan) with Fujairah (UAE) and a branching link to Muscat (Oman) in the Arabian Sea. The TW-1 system has a total capacity of 1.28 Tbps, which far exceeds the current bandwidth requirement of the country. TWA is a major competitor of PTCL and it claims that it carries about half of the international traffic from Pakistan, including many major cellular and broadband operators who transport their data through TWA network. After the entry of TWA in the market as international data carrier, the bandwidth supply market experiences high competition, resulting in a steep decline in rates for the international data transportation; reportedly a decrease in rates above 300% during the past 4 years. A comparative analysis shows that a STM-4 line that costs US\$ 150,000 in UAE and US\$ 70,000 in India, but it only costs US\$ 60,000 in Pakistan (est. 2010)<sup>73</sup>.

## 8.9 The Innovation Networks

The whole essence of being part of an 'innovation network' is the increasing realization among the market players that these firms in their individual capacity substantially lack the required scale of resources and competencies in order to survive in this highly competitive world, especially in the

<sup>72</sup> <http://en.wikipedia.org/wiki/File:SEA-ME-WE-3-Route.png> (Accessed on December 13<sup>th</sup>, 2010)

<sup>73</sup> <http://teletimesinternational.com/special/543/transworld-pakistan%E2%80%99s-first-and-only-private-submarine-cable-operator> (Accessed on December 19<sup>th</sup>, 2010)

telecom sector; which not only demands an increased level of innovativeness and product quality, but also warns about the shrinking time for the average 'product life cycle' and subsequently the reduced time for the delivery of new products into market. It has been acknowledged by many respondents that the vendors, operators and service providers are essentially becoming more like 'system integrators' and turn-key 'solution providers' by engaging with a range of local and international firms. These engagements through collaborative networks may take different forms such as joint ventures, strategic alliances, and long-term partnership and sustainable business relations with the supplier, distributors and buyers. In addition to that there has been observed an increasing trend towards product's out-sourcing and subcontracting to different market players, in order to complement the various parts of the value chain through effectively engaging these external actors within different types of horizontal or vertical business relations. Sometimes these companies are simultaneously competing and cooperating at different ends of the value chain; hence, the term 'Co-opetition' (Noorda, 2006) which refers to a 'cooperative competition' among the different market players.

The operators discussed different challenges as faced by these firms in maintaining such collaborative mode of business relations from the strategic, power balance, organizational culture and technical perspectives. From the technical dimension, it is mentioned that due to the extensive outsourcing and subcontracting different parts of the project (or the value chain) to different vendors and suppliers; the operators have to conduct 'Inter-Operability Test' (IOT) at each phase of the project; in order to ensure the overall product's conformity and compatibility. For example a broadband wireless operator tells that it gets the BTS from Motorola, core network from Cisco, software support from Oracle, and CPEs from different other vendors. In other case of a cellular operator, it acknowledges that its business operation takes support of massive outsourcing and subcontracting during the service delivery; right from the network rollout and managing core network till developing the billing and CRM (customer relationship management) solutions, which are accomplished by many local and international vendors like Alcatel, Ericsson, ZTE, Huawei and other Chinese and Pakistan-based companies. In the current scenario, these operators act like the system integrators or 'channel managers' in the development and delivery of their branded services.

It has been informed that even the vendors and manufacturers are often themselves not the 'Original Equipment Manufacturers' (OEMs); and these firms frequently make further outsourcing and subcontracting to other local and international companies in order to manufacture or develop the different specific parts of a total solution. Hence, in result the delivered value is actually an outcome of a collective effort involving a range of competencies and resources which are shared by the different networked companies, who are themselves unable to accumulate all those necessarily required resources and competencies under one roof. Hence, being part of such collaborative networks is strategically deemed as one of the crucial parameters for a firm's success in today's increasingly innovative, intensively competitive, highly resource intensive, and rapidly developing telecom markets. Thus, the author presumes that those firms which can better position and integrate themselves within these evolving 'innovation networks' would likely be the ultimate winners.



## Chapter 9

### The Role of the ‘Supporting Domain’ in the Diffusion of Telecom Services

There are many important actors and mediators who play a significant role in the diffusion process but they are not institutionally part of any of the above discussed domains; so these influential actors may be assumed making another domain, which could be named as the ‘supporting domain’. In this particular case, the supporting domain is considered to be composed of the financial institutions (banks, venture capital firms etc.), legal institutions (courts), academia (universities and research institutions), media (electronic and print media), labor unions, civil bureaucracy, and military (security forces and agencies). The respective roles of academia and bureaucracy will be discussed in chapter 10; whereas the role of labor unions has already been discussed briefly in chapter 6 under the section of ‘telecom reform’. However, the roles of the other above listed supporting actors with reference to the diffusion of telecom services in Pakistan have been precisely discussed here to better understand the respective roles and different perspectives of the involved actors belong to the supporting domain. The supporting domain should be imagined as surrounding the other four domains namely the policy, regulatory, supplier and user domains within the drawn actor-network map of the telecom industry; since the actors and mediators of the supporting domain presumably interact frequently with the relevant entities of the other four domains. As a matter of fact, without an active participation and a supportive role played by these actors of the supporting domain, the successful diffusion of telecom services would not be as smooth and effective as desirable by the other four domains.

#### 9.1 The Role of Media

By the time when the telecom sector was experiencing the reform initiatives, both print and the electronic media (broadcasting sector) was also going through the reform process. For example, the liberalization of the electronic media resulted in the opening up of more than 80 private TV channels, as broadcasting contents at the local, national and international scale. This brought a significant change in the society as a whole, but in particular it provided a new avenue and medium for an unprecedented access to the general masses. It has been told by the academics and operators that the media freedom; and in result the growth of media channels like mushroom played a critical role in the overall growth of the mobile services as well. It is because the private TV channels required sponsorships and ads from the cellular mobile industry (which was considered as financially among the most strong and growth-oriented sector); while at the same time the cellular companies also saw this opportunity of mass marketing as a new opening to further grow their market access and reach to the general masses. Hence, in this case the interest alignment was already there; and in result, the TV channels were bombarded with an immense amount of marketing ads, particularly by the cellular operators to promote their public image and services accordingly. Hence, the current cellular boom has been also attributed to these intensive marketing campaigns, which heavily impacted and influenced the mindset of the general public.

Therefore, the role of media (both print and electronic media) has been considered critical in creating mass opinion. The strong role and an immense impact of particularly the private TV

channels have brought a totally new sort of experience both for the consumers and for the telecom operators in terms of marketing. The reach and viewership of these private TV channels has been reported quite high in the country, due to the availability of different broadcasting networks such as; microwave TV boosters, cable TV, satellite TV and IP-TV. However among them, cable has been predominantly used as the primary access network for the broadcasting of these private TV channels within the country, whereas the satellite transmission has been used for the international viewers. In the recent years, IP-TV and internet TV is getting increased popularity especially among the international viewers of these private TV channels due to the high broadband teledensity in those developed countries where the expatriates are mostly settled down. On the other hand, the microwave based broadcasting network across the country is becoming redundant and underused, in quite a similar fashion like observed in case of the copper networks in the landline telephony. It is because the microwave installations for the broadcasting purposes are mostly used by military or by the government owned TV and radio channels (PTV and Radio Pakistan), whose viewership and audience are reportedly declined drastically after the advent of these private TV and radio channels.

As per the data provided by PTA, which is based on the survey results of Gallup<sup>74</sup> (Pak) and Mindshare<sup>75</sup> (Pak) for the fiscal year 2008-09; the share of advertisements relevant to the telecommunications sector have been reported as follows.

- The share of telecom ads is estimated around 25-35% (as per the results of Gallup and Mindshare respectively) broadcasted by the electronic media (TV channels); thus it stands at 1<sup>st</sup> position among the 11 compared sectors. Within the different categories of channels, the highest ratio for the broadcasted telecom ads was found in case of the news channels followed by the entertainment channels. Surprisingly the ratio of telecom ads was relatively much lower in case of the business channel (the only one channel), as reported by that time.
- On the other hand, only 7-9% (as per the results of Gallup and Mindshare respectively) of the total ads were relevant to the telecom sector, published by the print media (newspapers and magazines); hence standing at 4-6<sup>th</sup> position among the 11 compared sectors. Moreover, the relative share of magazine ads was found much lower than the newspapers ads.

It is worth to note the higher percentage of telecom ads in the electronic media as compared to the print media. By electronic media, here we mean primarily the TV channels, since the number and the marketing cost spent on radio ads has been estimated quite negligible, when compared with the televised ads. Even though the radio is widely listened within the rural communities but radio channels are not generally considered as an effective marketing medium by telecom operators, especially in comparison of the TV channels in terms of their relative impact. The telecom operators have been so far largely focused on urban population where TV has largely replaced the trend and need for listening to radio for the news and entertainment purposes. However, radio is still seen as an effective medium for nomadic use, especially in the public transportations or in the far flung areas where TV signals are still unavailable.

<sup>74</sup> <http://www.gallup.com.pk/> Gallup and Mindshare are among the major survey agencies of telecom market in Pakistan

<sup>75</sup> <http://www.mindshareworld.com/worldwide/asia-pacific/pakistan>

The reason for the relatively much lower share of telecom ads in the print media (i.e. local newspapers and magazines) can be attributed to the fact that the majority of illiterate people may have difficulty in reading or understanding the contents of the printed ads, however they can better understand the visual ads on TV. There is another fact that the printed ads are considerably cheaper in cost than the televised ads; hence the share of telecom ads (in terms of total number of ads) is higher on television due to incomparably high buying capacity of the telecom operators when compared with the small and medium-sized local enterprises, who generally prefer using newspapers and other traditional means for the cost-effective marketing of their products.

Ever since the sector deregulation and liberalization took effect during the past decade, numerous numbers of radio and TV licenses were issued to private investors, allowing them to operate their own broadcasting channels on the commercial basis. Hence, it resulted in an unprecedented number of private TV channels, which emerged and grew up like mushroom. Currently there are reportedly around 88 national and international broadcasting channels, in addition to around 33 regional (local) channels; and about 27 future channels (as expected to be launched soon). As per the available statistics, the national and international channels have been here further classified for the readers' convenience to better understand the pattern of channels distribution within different categories.

Channel Category	No. of channels
Entertainment (Including Drama, Music & Movie channels)	36
News	20
Religion	6
Life style & fashion	3
Food	3
Kids	3
Sports	2
Business	1
Education	1
Miscellaneous	13

Table 12: Number of TV channels in Pakistan as classified within different Categories

Source: Classified by Author (based on information available at)

[http://en.wikipedia.org/wiki/List\\_of\\_television\\_stations\\_in\\_Pakistan](http://en.wikipedia.org/wiki/List_of_television_stations_in_Pakistan) (Accessed on March 12th, 2011)

The above statistics reflect the general public taste, their demand for the required type of contents, and the usage pattern of electronic media in Pakistan. It is apparent here that people obviously give the most value to the entertainment and news channels; whereas relatively much less importance is given to the media use for spreading and retrieving business information, and running the technological awareness and educational programs. As looking at the above facts and the dominant trend, the telecom operators have also targeted mainly the news and entertainment channels for the marketing purposes, due to the disproportionally high viewership of those TV channels.

The regulator criticized the local media on its opportunistic stance by commenting that “the media generally portrays itself as a representative of the public opinions and consumers’ interest, but in fact the media has its own vested interests which it wants to fulfill under the disguise of ‘consumer rights protection’ campaigns”. An example was given that if a news paper or a media channel feels financially deprived due to not having received a privileged or preferential treatment in the distribution of telecom ads, then those news papers and media channels use their campaigning (propaganda) strategy as a media tactic to put pressure on the regulator and telecom operators in order to make them comply with their specific vested interests. PTA further explains that in fact, the ‘media trial’ by using ‘facts distortion’ as their tactic often does create problems for the regulator and different operators; and in result they have to maintain good relationships with all the significant media players. One way of maintaining these relations is at the organizational level by distributing ads with preferential treatment among those leading newspapers and media channels which are considered among the most significant ones; both in terms of their circulation or viewership, but also with respect to their relative ability to influence the market’s opinion i.e. their capacity to act as ‘opinion builders’ by using their potential bargaining & lobbying power. Whereas; at an individual level, the relations are maintained with the key individuals of those media channels by listening to their personal requests and queries more attentively, and thus accordingly offering them a range of personal incentives as well to keep them please.

On the role of media, PTA further critically comments that many media channels and newspapers often unnecessarily create hype for any particular issue to outperform their competing channels and newspapers in order to catch the headline making stories; and thus creating the breaking news for their viewers and readers respectively. However; in doing so, they often report news without having objectively covered the full story or having it properly analyzed in terms of digging out the actual facts, such as in case of the PTCL privatization, licensing issues, or on the occasional cases of service disruptions and excessively charged tariffs. “Of course, on different issues, different interests groups may have different opinions that they would argue for accordingly”, the regulator further reflects. The operators also agree with the regulator on the fact that a responsible role of media would be rather appreciated in this regard to not publish or broadcast news just for the sake of creating news or a thrilling story, until the actual facts have been properly investigated and cross-verified by multiple sources independently and impartially.

The regulator further criticizes media for not actively playing its role in educating and increasing the awareness among the masses about the effective and productive use of different telecom services. The private media has been called essentially a commercial entity that is seemingly more concerned about the revenue collection through printing and broadcasting the commercial ads. On the contrary media has been blamed for not showing any genuine interest in creating the awareness among the masses through developing and broadcasting interesting documentaries about the importance and usage of different telecom services; and moreover the potential impacts of the effective adoption of telecom services on the different aspects of public’s lives. Even though, reportedly there were some programs presented on these TV channels in this regard; however the relative ratio and impact of those broadcasted programs (documentaries) was considered very low

when compared with the momentum that is required to be created for the successful diffusion of ICT services in society with the desired impacts. In this connection, the academics point out the significant role of the newspaper in creating dedicated blogs and reading sections in order to effectively highlight the useful and productive use of ICT services in relevance to the different users' specific contexts of usage.

The telecom operators also didn't acknowledge the effective role of media in the productive adoption of telecom services in the local context. They argue that it is quite rare to observe any initiative taken by the media channels on their own to educate and making the local market aware of the effective and relevant use of telecom services, to help them enhancing their efficiency and performance level. It has been acknowledged that the development and broadcast of those televised documentaries aimed at creating the awareness among the masses essentially need to be linked with a broader agenda and a larger program (framework); in order to effectively preserve and continue the temporary effects generated by those broadcasted programs. Thus, a need has been commonly felt for bringing a grass root level change within the collective social attitude through basic education, to understand the real need for effectively adopting ICT services both for the individual achievements and also for gaining the collective benefits at a societal level.

## **9.2 The Role of Financial Institutions**

The term 'financial institutions' has been generally used as synonymous to referring 'banks' in Pakistan. Due to the strong emergence of a private banking sector over the past decade with the support of foreign capital, the banks have now developed relatively an increased scale of interactions with the general public and small businesses as compared to the past era. In the old times, the public sector banks were used to lending capital primarily to the large industrialist and feudal lords, as often backed by the politicians and sitting ministers. It has been frequently reported in media<sup>76</sup> and also by the courts' rulings that the powerful elements of society have been privileged with the loans at very easy terms; and even they used to declare their loans as 'forgiven' (or written-off) under the protection of government in amounts that range up to multibillion dollars just over the past couple of decades. But this lenient and soft gesture of those banks has been observed merely for those elite and ruling classes; whereas there is a completely different story in case of dealing with rest of the masses, including the individual entrepreneurs and Small & Middle-Sized Enterprises (SMEs). On the contrary, their plea for the loan acquisition often goes in vain, even when demanding for relatively much smaller amounts. Even if somehow they manage to get the loans, then the terms under which those loans are issued are very strict and inflexible. This unbalanced and unfair treatment under the supervision of the State Bank of Pakistan (the financial regulator) has gravely damaged the public's trust on the very essence of the banking system in Pakistan. The people consider the prevailing financial and banking system essentially an unjust and corrupt system that primarily protects the financial interests of the politically powerful socio-

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<sup>76</sup> <http://tribune.com.pk/story/69384/sc-seeks-loan-waivers-list-from-state-bank/> (Accessed on February 17th, 2011)  
<http://www.nation.com.pk/pakistan-news-newspaper-daily-english-online/Regional/Lahore/13-Oct-2010/Plea-seeking-details-of-written-off-loans-put-off> (Accessed on February 17th, 2011)

economic classes; but on the other hand providing no shelter and support to relatively the weaker segments of the society that compose the overwhelming majority of total population.

In the West, particularly in the United States; the concepts and the role of ‘Venture Capital’ (VC) firms and the ‘business angels’ are well acknowledged in supporting the entrepreneurship and innovations in those societies; but unfortunately due to an extreme lack of ‘social capital’ and ‘mutual trust’ in between the transactional parties, these concepts have not been able yet to flourish here. There has been reported the presence of three such VC firms in the country (Bayhan, 2005; Akhtar, 2008); however these private venture capital firms have played so far an unnoticed and marginal role with respect to creating the desired ‘entrepreneurial culture’ in society. Hence, it has been practically very hard to get any such ‘seed funding’ for the entrepreneurial projects or starting the ‘business incubation’ initiatives. Akhtar (2008) and Bayhan (2005) have recommended a list of structural, policy and institutional reforms for the ‘Venture Capital’ and ‘banking’ systems; in order to promote the entrepreneurship and innovation in the country.

As discussed earlier, ‘affordability’ plays a pivotal role in the diffusion of telecom services, which could be achieved primarily in two different ways: either by declining the prices at the supplier-end; or by increasing the customer’s buying power at the user-end. The first option has been already discussed sufficiently in the previous chapters at different occasions; however, it is the second choice where the financial institutions like the banks and credit financiers can play a significant role by facilitating people to get their requested small amount of loans swiftly under easy terms and conditions i.e. to be repaid in easy installments. In this context, the Bangladeshi bank named ‘Grameen bank’ sets an exemplary and legendary role for the other financial institutions of the world, with its micro-financing scheme to lend small loans to the rural-based social entrepreneurs in order to help them establish their own businesses primarily in the provision of telecom services to local communities; hence increasing the diffusion of telecom services in rural areas. In this context, the Pakistani banks are also expected to play a critical role in making these services and their accompanied devices (such as the mobile handsets, telephone sets, fax machines, desktops, laptops etc.) affordable for a common man, through offering an easy micro-financing scheme. They are recommended to initially target particular segments of the society, where the need is high but affordability is low; such as in case of the university students, rural entrepreneurs and low scale employees working for the public and private sector institutions.

In line with the above presented theme, the author conducted a trial case in order to judge the relevant banks’ responses on an investment proposal (see the appendix 2). The proposal was sent to three different banks and the concerned persons of those banks were also followed through several email reminders and repetitive phone conversations. The author found in the end a deadly silence with no interest shown at all on behalf of the respective banks in pursuing the proposal any further. The banks were not interested primarily because of lacking the social capital and trust elements in between the engaged stakeholders; since the banks considered such micro-financing schemes as highly risky investments in terms of the recovery of the given loans. This situation presents a starkly different scenario when compared with the previously mentioned case of the Grameen

bank's experience in Bangladesh, where they eventually recovered more than 97% of the disbursed loans (i.e. \$10.12 billion) paid mostly to the poor women living within rural communities, even without completing the unnecessarily lengthy and tiresome official procedures<sup>77</sup>; primarily based on the mutual trust and due to the presence of a high level of 'social capital' in that society.

In the above context, a US-based large computer vendor also shares its experience of pursuing such a proposal while engaging with the government, utility companies and banks as stakeholders in the proposed project in order to facilitate those people with low purchasing capacity to buy laptops or desktops for themselves through such a micro-financing scheme. In this case the banks were assured the recovery of their investments through utility companies, as making the payable installments part of the debtor's monthly bills (a model somewhat similar to the appendix 4). The vendor mentions that it had tried its level best to bring the different involved stakeholders on the table to discuss the possibility and viability of the proposal. The vendor also sent the proposal to government officials so that they could assess the worth of the proposed scheme, as it was essentially considered highly in line with their claims to bridging the existing digital divide in the country. However, it was told that unfortunately no positive response or willingness was shown either by the banks or by other stakeholders to participate in any of such collaborative initiatives.

The operators however view that in the presence of the current economic recession and the relatively weaker financial status of the banking sector in Pakistan; the banks cannot be expected to play any major role with respect to financing any such large scale initiative that primarily aims at serving a social objective by bridging the digital divide. Hence, they presume that it is primarily the role of USF Company to sponsor such projects which are deemed to be supportive in meeting the USO objectives, with the help of given subsidies. But the author principally disagrees with the above line of argument, based on the fact that the banking sector's relative lack of interest in such proposals could have also been observed at the time when the banking sector was actually booming; hence it seems more a matter of distrust and the lack of will, rather than the banks' current financial conditions. Secondly, it can also be attributed to the fact that often firms and the financial institutions get caught in the common fallacy of 'generating wealth from the wealth'; thus largely ignoring the possibility of creating value and worth from the 'bottom of the pyramid' by properly understanding and adapting the customized and self-sustainable business models for relatively poor and deprived segments of the society, as successfully experienced by Grameen Bank in Bangladesh.

### **9.3 The Role of Courts**

In Pakistan, the role of courts has always been prominent but especially during the last decade its significance and general image in the public's eye has been increased by leaps and bounds. Today, besides military and media, the courts are generally considered among the three most functional institutions of the state. The role of courts in shaping the telecom industry has been briefly discussed here in light of the facts highlighted by the respondents. By courts, it is meant here the judicial system of (provincial) High Courts and the (federal) Supreme Court. The respondents

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<sup>77</sup> [http://www.grameen-info.org/index.php?option=com\\_content&task=view&id=26&Itemid=175](http://www.grameen-info.org/index.php?option=com_content&task=view&id=26&Itemid=175) (Accessed on February 17th, 2011)



referred to different cases and occasions of the past few years where the courts were critically involved in resolving the raised issues.

Giving the example of the government's planned tax on SMS in order to generate additional revenue stream from this emerging profitable business segment; the respondents mentioned that the government had to eventually withdraw from its initial stance under the pressure of the consumer society and due to expecting a ruling from the court against the proposal. It has been further commented that the government actually wanted to impose this additional tax on SMS to also discourage the excessive use of text messaging for the political campaigning against the government policies, since SMS has now become a popular medium for propagating the political views and opinions quite rapidly among the mobile community; quite in a similar fashion as in case of exchanging messages on social networking websites, or through emailing and blogging. It has been further told that the courts often take stand against any politically motivated move of government that basically aims at confiscating the political opinions of the masses; in order to facilitate and cultivate the culture of using 'freedom of expression' through democratic means.

The courts are considered to be the supreme authority for resolving the issues related to any conflict between the telecom suppliers, and the policy and regulatory institutions. For example, the operators mention that if they come up with a serious dispute either with the regulatory authority or with the other state machineries such as CCP, FAB or MoIT that couldn't be resolved within the existing institutional mechanism set for the dispute settlements, then the next higher authority to be consulted with, in order to resolve those issues would be the court to get a final verdict. There are two more cases referred by the operators that also highlight the court's significant role in dispute settlement. The cellular operators mention that they may possibly go to the court against the regulator's failure in effectively implementing and enforcing the roaming restrictions on WLL operators, as it is clearly declared by the licensing policy. In another case, the LDI operators recently sue in the Lahore High-Court against the excessively high APC as currently charged by the fixed incumbent on account of compensating the additional uneconomic costs of access provision and expansion plans incurred by the incumbent in the rural areas. It has been reported in media<sup>78</sup> that in a couple of cases the court has overturned the decisions taken by the regulator; and instead accepted the appeals of the telecom operators against the PTA's rulings.

Finally, here three further cases have been reported to highlight the court's critical role in resolving the conflicting issues relevant to telecom industry. The competition regulator (CCP) points out that if any party has grievances against the decision taken by CCP then there is an appellant procedure to register the right of appeal. The complaint is filed in the appellant bench, and the following hearing and judgment is made by the Supreme Court. However, no such case has been noticed so far where a complaint has been filed against the CCP's decision because of the very transparent and

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<sup>78</sup> <http://www.allpakistaninews.com/pta-order-against-worldcall-suspended-by-lhc.html> (Accessed on Feb. 18<sup>th</sup>, 2011)  
<http://www.pakpoint.com/pakistan-telecommunication-authority-suspends-license-of-redtone-telecommunications/14441/> (Accessed on Feb. 18<sup>th</sup>, 2011)  
<http://propakistani.pk/2010/12/01/pta-suspends-braintels-license-for-offering-voip-calls/> (Accessed on Feb. 18<sup>th</sup>, 2011)

unbiased procedures followed in the commission's hearings, as asserted by CCP. It has been further told that many actors try to influence the decisions being taken on the merit in order to protect their own self-interests which are at stake; such as in case of the 'Sugar Mafia' and 'LPG cases', where large political stakes were involved. But CCP appreciates one good thing that goes in its favor, and that is the current judicial setup which supports and encourages them to perform their work transparently and to take decisions independently on merit. This has been called relatively a new experience in context of Pakistan, where people now celebrate a free and independent judiciary. Finally, a case was highlighted where the Supreme Court questioned the transparency and legitimacy of the PTCL privatization deal.<sup>79</sup> Also recently, in response to a case filed against the publication of Blasphemy pages on internet, the court made its ruling in favor of the petition; hence asking the regulator to temporarily block Facebook and all those websites that possibly connect to those pictures.<sup>80</sup> All of the above mentioned cases clearly reflect the strong role of the courts and their impact over shaping the local telecom industry.

#### **9.4 The Role of Military**

In the developed part of the world; particularly in United States, the military role has been found legendary in the promotion of scientific research and technological developments in collaboration with universities. Today's most amazing inventions including the 'internet' itself which has undoubtedly changed the whole shape and competitive landscape of telecom industry is primarily the outcome of this significant military-academic research collaboration. During and after the World War II, there have been remained close research ties in US between the universities, industry and government (i.e. the military and ministry of defense) in developing joint scientific, industrial and military applications. Such applications primarily included the research areas like nuclear, space, automation & control system, missile, laser & optics, wireless, internet, computing, electronics and satellite communications technologies. The research outcomes of these primarily defense-led projects were later gradually transferred to the industry for developing commercial applications; in order to gain financial benefits through nourishing new markets for those applications. These collaborative projects were heavily financed by the US government; hence these massive investments in R&D activities essentially gave a substantial boost to both its scientific research capacity and industrial growth over rest of the world. Over the past few decade, some other countries have also tried to successfully replicate the US 'triple-helix' model of innovation; such as in case of China, South Korea and India. These catching-up countries have now also built up their own indigenous research & production capacity to get their respective shares in the global markets.

In order to properly understand the role of military in Pakistan within the context of telecom sector, it seems relevant to first understand the some relevant facts about the military. Regarded as 7<sup>th</sup> largest army in the world and the most disciplined and organized institution in the country; the army historically has had largest stakes in the country's ruling history, its decision making capacity on key issues, and in the budget allocation. With an annual increase of military budget up to 16.5% in the fiscal budget 2010-11, its annual budget has now raised to a new record level of Rs. 442 B (\$5.2

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<sup>79</sup> <http://propakistani.pk/2009/10/13/ptcl-privatization-scandal-chief-justice/> (Accessed on February 18<sup>th</sup>, 2011)

<sup>80</sup> <http://news.bbc.co.uk/2/hi/8691406.stm> (Accessed on March 18<sup>th</sup>, 2011)

billion). The armed forces have taken control of the country's political regime several times since the independence; mainly using the pretext of the lack of good civilian leadership, while calling the democratic governments as corrupt and inefficient regimes. In the budget documents, two components stand out; namely the 'debt servicing' and the 'defense budget' allocations, as both of them have grown over the years for their own reasons. Mir (2010) explains that Pakistan's defense budget has traditionally been based on providing stringent funding to the military in order to maintain a 'minimum deterrence' capability against India. Based on such 'India-centric' military doctrine, the military analysts view that Pakistan's defense budget still translates about 6 times lesser than of the India's ever-increasing sky-high \$32 billion defense budget during the last fiscal year. Mir (2010) further comments that 'India's attitude does not give Pakistan an iota of a reason to change its existing threat perception'.

The telecom operators were generally found quite dissatisfied with the 'spectrum occupation' issue by different government institutions, especially the unauthorized use of frequencies by the military and security agencies, which cause serious disruptions in the operators' network expansion plans and operational capabilities; both in terms of improving the signal quality and realizing the future technological developments e.g. in case of the 3G licensing process. Hence, they demand for the evacuation of those occupied band of frequencies; so that the spectrum could be effectively used under the ITU regulations for the civilian, scientific, industrial and commercial applications. The above discussed productive and desired role of the military for nourishing the ground for the scientific research and industrial development has been found largely missing in case of Pakistan; in result the military expenditures on its defense related research didn't benefit the country's overall research capacity, competence building, industrial development and the economic performance in any capacity. Hence, the author presumes that this inter-institutional isolation and dissociation has eventually turned the country into essentially a 'consumer society' (consumer market); and it couldn't enjoy yet the benefits of being a 'producer society'. Consequently, the government's huge spending on the enduring military budgets and defense related projects didn't benefit the local telecom market or the society in general; in terms of the social and economic welfare of the country.

After knowing this contextual analysis, one thing is apparent that, in result of this ongoing 'Cold War' between the two regional military powers i.e. Pakistan and India; the actual losers are the impoverished and poor segments of both societies that account for more than 90% of their total population. These people are more concerned about having food and fulfilling the basic life necessities rather than in weapons, power politics and endless arms' race between the two military powers. The common man desires for the end of this vicious cycle and hopes for the allocation of those huge military budgets for the social and economic welfare of both societies. That dream may possibly be realized if the political regimes of both countries agree on signing a political pact of military disengagement for the next 50 years under the UN supervision (if to be trusted). But that requires a strong political will and determination on behalf of both countries. The author hopes that it would eventually result in the economic prosperity and an increased affordability of a common man; and hence an increased diffusion of telecom services in the region for the social and economic benefits of its people.

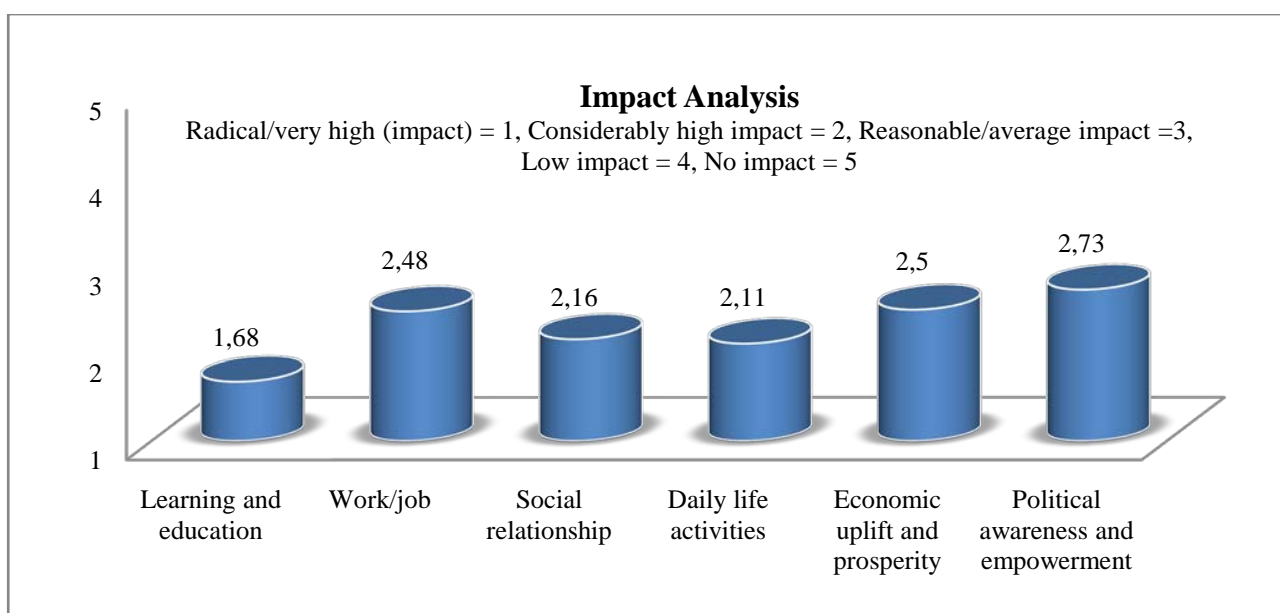
## Chapter 10

### Impact Analysis

This chapter focuses on making a comprehensive account of the observed impacts of the use of telecom (ICT) services on the public's life from different aspects. The first half of this chapter is composed of three subsections while shedding light on the positive, neutral and negative impacts of ICT services respectively, as perceived and experienced by the telecom users themselves. Whereas the second half of this chapter shares the opinions of different telecom market experts including the informed users, who thoroughly discuss the ICT impacts upon bureaucracy, academia, and the socio-economic and political aspects of life.

#### 10.1 Impact Analysis of Telecom Services from the Users' Perspective

In order to gauge the impacts of the use of ICT services on different aspects of life, the telecom users were asked to quantify the relative impacts of ICT services using 1-5 Likert scale in the questionnaire. The following graph as derived from the received data highlights some important results in this regard. According to the graph, it appears that the users experience highest impact (even above than 'considerably high') of the use of ICT services on their learning and educational activities. However, this result is quite understandable and predictable, knowing the fact that most of the questionnaire respondents were the college and university students in our case.



Graph 19: Impact Analysis

Source: Author

The users observe the ICT impact on their social relationships and daily life activities somewhat close to considerably high level. However; the relative scale of ICT impacts on their work performance at jobs or upon their earnings and the economic uplift have been ranked on the third place, somewhere in between the considerably high and the reasonable level of impact. That may be

partially due to the fact that most of the students generally do not work as professionals within their field during their studies, since it is often quite rare to get a professional job before finishing the studies. Finally, the graph reflects that users observe relatively least impact of ICT services in terms of political awareness and empowerment among the users and general public. That clearly indicates that the diffusion of ICT services could not bring yet any significant change within the local communities in terms of an increased political awareness, empowerment and participation; the way we commonly observe in the developed countries, or even the way we have recently witnessed during the current political awakening in many countries across the Middle East.

### *The Classified Categories of Users*

During the in-depth analysis of the users' comments on the relative impact of ICT gadgets and services on different aspects of their life, there were found three different categories of responses. The first category was in strong favor and support of ICT services advocating for their rapid diffusion and adoption even without any need for supervising or controlling through any regulation to have a check over the pattern of their usage in the society, since they consider that market should be let free to decide how to use the technology; instead of putting restrictions from the supplier's or regulatory end. This group of respondents was also reluctant in accepting any considerable negative impact of these technologies on their social life. This group of users is often found to be too straight forward and less hesitant in adopting any new technology purely based on its technological merits without falling into debates regarding their impacts in the broader socio-economic context. This category of users essentially represents the 'technology-driven' user segment, which is mostly composed of the initial two adopter categories named as the 'innovators' and 'early adopters'.

The second pool of respondents was rather keen to opt for a more balanced position in terms of evaluating the impacts of ICT on their life. They impartially look at both the pros and cons of the new technologies. This category locates somewhere in between the previous and the forthcoming categories. Hence, they are to some extent conscious and reluctant users, and are generally more 'image-driven', which means that they often make their mind-set only after reviewing the experiences of the lead adapters and the general market reviews. They are both excited to adopt the new technologies, but also equally conscious about the possible negative consequences and impacts of the adoption of new technologies; hence, this category is mostly composed of the adapter category called the 'early majority'.

The third pool of users is the most typically found vast majority who often remains highly conscious, reluctant and conservative in their approach towards welcoming and swift adopting the new technologies. They show high 'inertia' and resistive attitude to any change in their existing setup and the established status-quo. They resist to any 'change' that demands something from them in terms of spending additional money (i.e. the differential cost in result of bearing the switching and purchasing costs), a changing social behavior (i.e. discarding and unlearning the old patterns of work, and learning and adopting the new practices and routines into their life), or a change in the cultural context (i.e. accommodating any new ideas and attitudes whether productive or destructive that potentially mismatch to their cultural norms and values). Hence, this group of respondents has

been found often highly skeptical and critical in their impact analysis of ICT services. This category of users often seem to be more critically concerned about the resulting impacts (both positive and negative) of the new technologies; rather than getting obsessed with the technology (or with any technological attribute) itself. Hence, this category can be assumed as the 'impact-driven' category, which actually represent mostly the largest part of the adopter categories namely the 'late majority' and the 'laggards'. If we combine the above mentioned last two mentioned categories of users i.e. the 'image-driven' and 'impact-driven' into one single group, then this combined category could be named as the 'market-driven' as opposed to the 'technology-driven' user category discussed earlier.

In the following analysis, the users' responses regarding the impacts of the diffusion of different ICT services within the local context are reviewed, with the primary focus on impact analysis at this stage of the debate. These responses are collected from the qualitative parts of the filled questionnaire, and from interviews and general observations. In line with the above discussions, the responses of the users have been here classified within the following three major categories.

#### **10.1.1 Category 1 – Positive Impacts**

In this category, the respondents largely consider that ICT has brought positive changes in their life; however, they did not refer to any significant negative impacts of the use of ICT services on their studies or social relationship; instead they observe more positive impacts of the use of these services on learning & education and building social relationships. They argue that they can now save time for other important stuff by using these services; instead of physically going somewhere for meeting an individual personally. Nevertheless, they still manage time for face to face meetings with their close friends and relatives, despite the intensive use of these ICT tools and services. For them, the telecom devices and services make their life significantly easier, and the use of these services have facilitated them strengthening their social relationship even with those people as well living across the world, who they never thought to meet ever in their life. With the help of different internet applications, they came to know even their childhood friends, and they are now in touch with a lot of people from all over the globe. They can better update themselves with the current status and activities of their friends and relatives even on momentary basis. They feel generally good to remain connected with a large pool of their friends and social circle; however often in form of keeping 'loose-connected ties' maintained through different ICT applications.

The use of ICT services has been especially appreciated in context of maintaining relationships with those who are far away and hard to reach. Some of them consider that utilizing these electronic means to virtually communicate for exchanging information is even better than meeting someone personally. They view that these information and communication technologies (ICTs) have significantly helped them in communicating with more people for exchanging extensive amount of information at a scale that was unthinkable before the advent of these technologies, but relatively at no cost. Hence, they are now in good connection with a very large pool of information sources and capable of retrieving and sharing any amount of required information, essentially in no time. Apart from saving time and resources, they also give high value to maintaining their relations now more effectively and conveniently. They conclude that ICT services have greatly helped them in



developing and maintaining their social relationships, since they can now communicate to any one from anywhere at any time. Some users mention that they are so used to with these communication gadgets and their different applications that they literally feel very anxious, incomplete and even sometimes quite depressed if these services (particularly in case of the mobile and internet services) are not accessible to them or are disconnected for some reasons. This last discussed impact has been also repeated by the other pool of respondents as well, but from a negative perspective.

### **10.1.2 Category 2 - Neutral Comments**

The size of respondents falling into this category was relatively quite smaller than of the other two groups of users, as they were representing the two extremes of the pendulum. This group of respondents argue that the technology itself cannot be blamed for creating any good or bad impacts but it is up to the users how they use a technology, or in another words for what purposes these technologies are actually being utilized in any particular unit of adoption; whether it is an individual, a home or office, a particular group of users, or collectively the society itself. This category generally keeps their opinions on average in terms of rating the scale of 'ICT impacts' (whether positive or negative) on different aspects of their life. They view that ICT has generally facilitated and statistically increased their performance and ability to exchanging information and managing communication between multiple connections. In their view, ICT also helps in building social ties when effectively used. These services are seen particularly useful in enhancing the level of impact and productivity when purposefully used within the restricted amount of consumed time. However the time-unbound use of these services has been also blamed for becoming the main reason for the reduced physical interactions, weakening family-unit and the lowering scale of emotional attachments and bonding among the social ties living within the immediate vicinity. This inference has been made by comparing with the earlier days when people were used to meet each other by personally visiting them in order to get personal attention.

In their view, the users generally have a list of appreciations for these ICT services but at the same time they also have a list of complaints and grievances as well; no matter what telecom services they are subscribed to. They think that the users usually make their mindsets in result of building a collective impression about a particular technology after getting influenced or inspired by the peer reviews or listening/reading to the expert opinions commonly spread through 'word of mouth', media marketing campaigns, or through their general observations. Hence collectively most of them follow the on-going or the future projected trends, and accordingly try to adjust themselves with the dominant themes through gradually building or accepting the positive image of the new products or services on their perception over time. In their opinion, the users eventually then try to ignore the perceived negative impacts and extra consciousness towards adopting a new technology out of the fear that if they won't follow the dominant trends, they would be considered as outdated and probably misfit for rest of the society; hence here the element of social pressure in the 'innovation-decision process' cannot be ignored.



### 10.1.3 Category 3 – Negative Impacts

This category represents the largest opinion poll of the collected data sample. The comments passed by this group of users have been further clustered within the following four categories in the chronological order as per their perceived level of importance, from the users' perspective.

#### *Deteriorating social relations, health issues and physical activities*

A very large number of respondents were found highly skeptical about the negative impacts of ICT services on their social life and relationships; in context of considering the potential harm of the adopted services on their traditional rituals, social norms and cultural values. They illustrate that due to the increased use of ICT services, especially among the youngsters and socially upper-class segments of the society; there is an observed gradual shift within their attitude with respect to personal communication (physical meetings) towards verbal communication (telephonic conversations), and now a further move towards textual communication (text messaging, emailing and chatting on different social networking websites). In result, the tradition of face-to-face meetings and personal or physical interactions has been called steadily declining, which may have possibly resulted in many social problems and consequences in terms of the weakened interpersonal relations and loosened social bonding, as observed by the respondents.

It has been further discussed that the excessive use of ICT services plays a significant role in currently observed gradual transition within the societal attitude from being a communal-based entity towards being more an individualistic society, where especially the young generation of ICT users have been increasingly observed lacking their social bonding and family attachments. These youngsters have been also called less familiar with the traditional ways of greetings and meeting protocols, e.g. paying condolences and sharing sympathy to someone at mournful occasions; hence resulting in a deteriorated quality of interactions and relationships. Now personal meetings have actually shrunk to only special moments; such as the yearly greeting celebrations or at the birthday parties, or when there is some personal interest involved, as commonly observed. The respondents further argue that this situation eventually results in the dilution of genuine relations based on deep mutual respect, and true feeling of love and affection. The increased distance in the physical proximity has resulted in less empathetic and relatively a shallow society. They further comment that despite the fact as the numbers of connected people and cyber interactions have been remarkably increased, but ironically the people are becoming more mechanized, calculated, selfish and less concerned about their surroundings. They consider that ICT has rather created an artificial world where people are often unaware and less concerned about the people living around them, but on the contrary they are more lost and obsessed with the others, located relatively far-distant away. In result, people are generally found more concerned and informed about the global events happening at far distant places than knowing or caring much about the people's grievances living in their immediate vicinity. It has been further told that people have been also observed now less participating in the social work and communal activities. However, the author again objects here on drawing any fast conclusions, as realizing the fact that there must be many other reasons and variables involved in this gradual change of the societal attitude; hence, merely the extensive use of ICT services cannot be blamed for all those observed social changes and negative consequences.

Due to the increased cyber networking with anyone located anywhere at any time as per the users' choice, many respondents presume that the underlying 'value' of building relationship has been itself severely damaged; since it is now become more like a fun to make friends and accordingly breakup the relationships whenever one wants it, thus showing no commitment to each other. A research survey<sup>81</sup> even divulges the fact that the inappropriate use of Facebook has been considered among the major reasons for the currently an increased number of divorces, particularly in the developed countries where its use is significantly high among the general masses. Hence, it is viewed that the increased but inappropriate use of ICT services has collectively declined the strength of our 'social values' and the quality of 'social ties'; however, it has definitely improved the scale (frequency) of 'social communications' in general terms.

It has been further debated sarcastically that the increased communication has rather resulted in creating further 'isolation'. The gradual shift from personal interactions to voice conversations, and now to textual communications can be very manipulative and misleading itself. Hence this new trend may lead to severe misunderstanding, confusion, and conflicts among the correspondents in result of an increasing dependence on the verbal and textual communications taking place at distant places. It is because the new ICT based communication means often miss the elements of physical presence, personal expressions, the use of body language and the emotional attachment during the communications process; so that people could immediately make the conflicting points clear and to better understand each other's perspective on an issue. The quality of textual communications particularly among the youngsters has been also reportedly quite deteriorated in terms of the quality of the written draft due to the use of shortened (e.g. wrong abbreviations) and mixed version of the writing style (e.g. simultaneous use of multiple languages within a sentence), which has been considered as becoming a major reason for the currently observed 'linguistic distortion' phenomenon. Additionally, the virtual existence in the social networking websites has turned out to be a superficial means of keeping in touch. On the other hand, the real spirit of actual interaction and the underlying emotional touch of the physical meetings are called to be gradually vanished; resulting in a world where people live in their self-created bubbles. It has been further said that a person obsessed with ICT services and living in his own 'cyber-bubble' has always too much things on its mind, and he/she looks like being occupied all the time. Often they seem to be so much engaged with their ICT gadgets that they are literally unable (due to being mentally occupied and often distracted) to properly give time to their family members and even to their guests.

The users further explain that the increased use of ICT for information acquisition through internet and by continuously being updated with RSS feeds on their mobiles may potentially create mental stress and tension; especially when different rumors are deliberately being spread around as a tactical means to just sell the news by grabbing the attention of the readers. Some people have been even found addicted to those ICT gadgets and services, and at times when they are disconnected for some reason, they even get depressed and deeply upset; hence, potentially becoming a reason for different psychological problems like the usual stress, depression and frustration sort of feelings in

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<sup>81</sup> <http://www.telegraph.co.uk/technology/facebook/6857918/Facebook-fuelling-divorce-research-claims.html#>  
(Accessed on March 18<sup>th</sup>, 2011)

their temperament. An interesting case has been highlighted here that at occasions, when the desired social contacts do not respond or contact back by phone, and when their emails and text messages are not being responded immediately for any reasons, the caller (or the contacting person) sometimes get upset with that situation as often presuming that the other person is in some ways being rude to him/her; no matter even if the called party was unable to pick up the phone or respond to a sent message for some very genuine reasons (say sleeping, driving, in meeting or even using washroom). Hence, an obsessive and uncontrolled use of these services may potentially create an increased hyper sensitivity, mental tiredness, losing focus and other social and health problems among some users, if the possible negative impacts and issues related with the inappropriate use of these ICT services and gadgets were not properly realized and addressed accordingly.

Finally, it has been added that due to the intensive engagement with ICT devices, the trend of recreational and sports activities are also as reported gradually diminishing among the excessive users of these services. They have been often observed as even feeling like handicapped without having access to these facilities, once they got used to and addicted with these different digital gadgets and ICT services. The ICT users further point out the fact that this increased dependence and overuse of ICT services often creates a sluggish attitude toward physical work, in result people are seen as becoming increasingly dull and lazy. However again the author doesn't agree that all these symptoms and physical manifestations in our changed behavior and social attitude can be merely attributed to the extensive use of ICT services; and there must be many other important elements, dimensions and variables as well which cannot be ignored; such as the increased dependence on different sorts of machines including the home appliances, TV and automobiles. The users also found that the trend of sending hand-written greeting cards on special occasions, and the hobbies like adventurous activities, artistic work, gardening and reading books have also been observed severely got affected due to the increased use of these new services. The author concludes the debate here by saying that 'objectively' ICT has facilitated and enhanced the scale of interactions and the number of social connections; but 'subjectively' it has reduced the quality of social interactions and the strength of social ties. Secondly, the people have generally now become more informed and concerned about the world that is distant apart, but less concerned and caring about the people living around their surroundings and immediate vicinity.

### *Wastage of time*

The respondents (mostly students in this case) mention that their ICT usage sometimes goes out of control and time-unbound. The services occupy them to that extent that they find less time for their curricular activities; admitting that an uncontrolled and careless usage of these services may cause severe disruption in their studies. They observe that the users gradually become less conscious about the importance of limitedly available time. In this regard, the most disrupting and time consuming elements identified in their routines were: the reading and responding to text messages, untargeted web-browsing (mostly for fun and entertainment), long voice and text chatting on internet (at messenger, Skype, Facebook and other social networking websites), mobile voice calls, emailing, and the stuff like watching YouTube videos, and acquiring information (e.g. news reading). It has been admitted that most of the users get addicted with using these different ICT

services and applications over the time, and it becomes a habitual practice ('social lock-in') to regularly carry on the attachment and to keep engaged with these services on frequent basis. Dealing with the huge amount of information/data that is currently available on internet (and which is rapidly spreading every moment one logs in) hence given the name 'Information explosion'; has now itself become a major issue for most of the internet surfers. The author recommends those net surfers to learn the essential skills of quickly spotting and retrieving the required information in an effective way; since in today's information world, the increasing thirst has been felt for the authentic and relevant (desired) information and not just for acquiring piles of information.

### ***Moral values and Ethical concerns***

From that perspective, the respondents comment that the misuse of these services may create serious moral and ethical issues, which also threaten the prevailing social norms and cultural values. Such misuse has been called a major reason for the ongoing moral and ethical degradation, especially among the youngsters. In Pakistani context, those unethical applications which are generally considered as mismatched with the social norms and cultural values were listed as: the open display of quite personal photos (especially in case of girls and woman) on the social networking websites, joining the 'dating' sites, watching vulgar websites with display of sexual contents, and the time-unbound and meaningless chat (either on phone or at internet) as predominantly observed happening among the youngsters just for fun and gossiping. The elders and guardians have been particularly found extremely worried about their kids' moral and educational development as they were increasingly being exposed to these ICT gadgets and services.

### ***Privacy and Security issues***

The respondents also mention the fact that they are not unchecked in their usage of ICT services, since their parents often supervise their activities during the use of these services. This continuous watch and supervision has been considered as an intrusion to their privacy by some respondents as they feel restricted and heavily supervised during the use of these services. Their parents also forbid them playing excessive games on their mobiles phones or at computers; instead they preferably want them to come out of their rooms and rather play physical games with their friends in open fields. The respondents highlighted another important aspect by mentioning that the features of an increased connectivity and visibility within ICT gadgets and services may themselves become a curse, if a person is exposed and accessible to everyone at a level where the user couldn't protect and preserve its privacy; which may turn into a seriously disturbing element and an irritating factor. This is a common experience for those who become part of internet communities and the mobile networks at different social and professional levels. They excessively feel like being all the time occupied, connected and accessible; hence, their privacy is increasingly being restricted.

Most of them complaint for being teased and frustrated by the frequently received different types of wrong, missed, malicious, unwanted and marketing calls, emails and messages on their mobiles, fixed phone and in the inbox of their email accounts. Due to their personal profile being accessible online on different social networking websites or other public data sources (including the contact information); in fact makes them very much exposed to everyone (even though it's an optional

choice to keep such information accessible to public or not). However, making such information available on the public forums potentially let others with an opportunity to freely pass comments on their personal life and matters (such as on 'Facebook'). In result, often it is seen that people don't share their genuine information and personal profile on internet. Consequently, the hiding or misleading about the personal details and information while engaging with unknown people e.g. through using fake identity may potentially create a very superficial world of building relationships. In result, such fragile relations which are essentially built on fake identities and misleading information often end up in tragedy, since sooner or later the reality is disclosed. Finally, a genuine concern among the users was to asking for the protection of their 'freedom of speech'; so that the users could openly share and exchange their political opinions without any fear of being monitored or detained by some authorities.

On the security issue, two types of concerns were discussed. First, improving the general law and order situation where people could feel safe and secure while using their laptops, mobile phones and other expensive digital gadgets at the public places without having the fear of being robbed, or their stuff being snatched or stolen. The second type of insecure feeling prevailing among the users was how to deal with the internal system's security, and that demands making the online transactions (through mobile or using internet) a safer choice for ICT users without having any fear of financial loss or any potential risk of fraud. In addition to that, the fear has been also high that their systems may become infected with any form of malware, adware or viruses, which are widely spread on internet and they may potentially damage or corrupt the systems.

## **10.2 A Detailed Impact Analysis from the Experts' Perspective**

In the following section, the impacts of ICT services on the Pakistani society would be analyzed at three different levels namely: the bureaucracy (in terms of the observed improvements in its efficiency level and relative performance); the academia (in terms of enhancement within the learning and educational activities at secondary and higher level education); and at the societal level to observe the use of ICT impacts on general public (in terms of their changing social behavior, economic uplift and political empowerment).

Generally, the academic administrators and civil bureaucracy in Pakistan has been largely observed not fully aware of the scope of ICT applications and about the effective use of those services within their own context of usage. For example, many of them were found wondering and sometimes even quite doubtfully questioning about the possible range of applications and the projected benefits as expected to have achieved in result of an effective adoption of these services in their daily routines and work practices. Hence, often it was hard to convince them commit their organizational resources (i.e. the required amount of time, personnel, training facilities, sufficient financial resources, and the necessary space for the deployment of basic infrastructure); in order to realize a full-fledged implementation of ICT facilities within their organizational boundaries. However, many academics and bureaucratic officials were arguably saying that the ICT diffusion within their work boundaries should be considered as a transitional and gradual adoption process, which would take place on its own pace by itself over the time just like in case of experiencing the gradual

diffusion of radio, TV, cellular appliances and other digital gadgets within the society. Hence, they didn't feel any need for devising deliberate policies to make an effective, rapid and smooth diffusion of ICT services possible within the focused units of adoption, through employing well-planned and conscious efforts.

Furthermore, many officials were found quite critical about the potential negative impacts of ICT services on their existing social and organizational norms, cultural values and work practices, especially due to the prevailing negative impression of the misuse of these services within the moral context. They were also highly doubtful and concerned about the unnecessary waste of time in case of their excessive usage, an overwhelming dependence on these devices and services, and the potential risks involved in using these presumably unsecured communication channels for the exchange of official and classified information. However, many of them did not actually realize or they were not aware of any such technically robust, secured and authorized systems that could have addressed their potential worries through employing an effective use of 'digital signatures' and access passwords in order to fully ensure the authorized access to different classified contents and sources of information. However, instead of spending efforts on making their communication channels more protected and secured for the exchange of information; the general tendency among those authorities within the observed institutions and among different individuals (e.g. parents) was to avoid using those services or putting stringent restrictions over the use of those services under strict supervision.

It was found that quite a few senior academics and bureaucratic officials still prefer the continuity of their old style of doing work e.g. through manual delivery and storage of the hard copied documents in bulky files from office to office; no matter, even if that would have required them constructing new buildings to accommodate the additional large spaces for the physical storage of those documents; however many of them were not yet fully convinced to only rely on keeping soft copies through hosting a computer 'server' within the space of relatively a very small room. They were also generally not that much conscious about the time-delay factor; regardless of the fact that these manual procedures would have substantially delayed the average time of handling the cases further in weeks and months. In addition to that, they were also apparently less concerned about the 'environmental impacts' of the excessive use of papers in their surroundings, especially within the bureaucratic and academic world. Even if there were some consciousness existed about the excessive use of papers for the printing, faxing, copying and physically storing those documents; then it was found primarily led by the 'cost element' (i.e. the cost of the consumed papers and toner cartridges). Finally, an effective use of the concept of Virtual Private Network (VPN) based 'home-offices' was also seemed to be practically non-existent; hence the academic and administrative staff was generally bound to stay in their offices during the work hours, even though if they could have performed their work effectively from their homes or elsewhere, while being connected to their office networks (computers) and databases at distance. It is assumed that an effective use and adoption of the VPN service would also help encountering the current power shortage crisis; thus by effectively adopting VPN into offices, the government won't need to announce additional holidays just to save the energy during the work hours.

At many occasions, the academic and civil administrators, and sometimes even the broadband operators as well, were quite frankly declining the rationality and feasibility of a conscious and planned approach towards the diffusion and adoption of ICT services at an institutional level; since they consider such a deterministic approach too unrealistic and overwhelmingly ambitious, particularly in the local context. They further added on that their respective institutions couldn't follow the ICT adoption process with that fast pace, especially when they were given the examples of the success stories of the developed countries. However, a general commitment was shown at occasions by the academics, civil administrators, and operators for participating and cooperating within a broader initiative, if led by others. But what was the missing element in solving this 'puzzle' was the adoption of a proactive approach by themselves through taking the lead and engaging the other stakeholders in building the momentum for a mass-scale adoption of ICT services, particularly first within their own institutional or organizational boundaries. Conversely, it was found that they were relatively more eager in passing the blame upon someone else; hence holding others accountable for the past failures in case of the effective adoption of ICT services.

The competition commission (CCP) considers in this regard that there is a certain degree of strong rigidity and inertia in the basic Psyche and the prevailing mentality of the bureaucracy, especially within the public sector institutions to oppose any change within their established routines in order to defer the pressure of continuous learning or adapting any change within their organizational processes and work practices. It has been further told that a broader change and the continual reform process within the organizational culture and work practices cannot be implemented without the proper monitoring and committed efforts on behalf of the top management and government officials themselves. However, that may only happen if those officials first commit themselves to adapting the changing culture and its requirements with positive spirit. CCP further argues that as a nation, we didn't move like an information-driven society, whereas the old conservative approaches and the traditional ways of doing business still largely prevail across the country in all walks of our life and in different institutions; including the government, academia, bureaucracy, industry, businesses, banks, security, transportation and health sectors. Hence, still we commonly observe strong social and cultural barriers along with the system level resistance everywhere; whenever there is an attempt to implement any change in accordance with the new ICT based efficient processes and practices. The dominant authorities of the society often resist any change even the positive ones due to inheriting the typical attributes of an overwhelmingly stagnant society. Hence, overcoming this stiff resistance and inertia in pursuit of an effective adoption of the new technological developments and telecom services would essentially require a well-convincing reason with a list of incentives that could outweigh and overshadow the prevailing old-practices. This has been considered a critical parameter in order to facilitate the timely and efficient adoption of new ICT developments, and to encourage the society to discard the unproductive, ineffective and obsolete structures and practices accordingly. In addition to that, the new incentives of adopting the ICT services are required to be properly marketed on the realistic ground, after correctly understanding the actual needs of the society in order to effectively overcome the existing social, cultural, moral and technological barriers.



On the contrary, the presence of any clear game plan, a strong political will and a full-fledged institutional support for the adoption of ICT based new systems and services has been largely seen absent so far, since often the outlined vision and the policy statements are only found appealing on the papers or only to an extent of the meeting rooms' gossips; but with no practical impacts and measurable outcomes in the field. In this context, the academics further comment that if the things were left on the bureaucracy and the existing establishment, then it would be quite unlikely to realize any change on the ground level, since the current management and administration would never dare to take the risk of bringing fresh blood and to float new ideas into action; as they may consider these young, visionary and technically skilled employees a potential threat for their long-lived dominance over the existing management practices and decision making processes. The academics presume that the old-fashioned existing officials may potentially create barricades to discourage any move towards bringing any change in their established status-quo, primarily due to the well-acknowledged fact known as 'NIH' ('Not Invented Here') syndrome.

### **10.2.1 ICT Impacts on Bureaucracy**

Responding to the question that what percentage of official work in the public departments are being performed using different ICT services; it was stunning to know that currently about 90% of the bureaucratic work is still performed through traditional means of manually transferring and storing files in hard copies in most of the official departments (apart from some of the distinguished departments such as NADRA, FBR, PIA<sup>82</sup> and the banking sector). Hence, only 10% of the official work is assumed to be performed taking the support of fixed line, mobile phone and internet services (including the use of official website, email correspondence and other web applications). However, this assessment doesn't include the use of fax, which has been used quite extensively for transferring documents and exchanging information; whereas oppositely the trend of sending files as scanned documents attached with emails has been relatively still very low, particularly in case of exchanging classified and official documents.

The primary reason for avoiding the use of ICT services for the exchange of information was mentioned the absence of the personal 'hand-made signatures' of the undersigned persons in case of transferring the digital documents using internet. These handwritten personal signatures on the official documents are considered critically important because their presence ensure that the undersigned persons might be held accountable for the authenticity of the delivered information. However, there were also quite a few officials who were highly proficient in the effective use of ICT services; however mostly their knowledge and skills about the effective use of ICT applications to enhance their work performance was the result of their own efforts in their individual capacity. Conversely speaking, their ICT skills were often not developed in result of a conscious effort committed by their associated departments; either in terms of making the use of ICT as part of their work culture, or enforcing it as an official requirement for them to follow a specific course or training session. On the other hand, a vast number of relatively old-fashioned officials sitting even at the higher official rankings were found quite unfamiliar with the essentially required very basic

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<sup>82</sup> NADRA, FBR and PIA stand for the public institutions namely; 'National Database and Registration Authority', 'Federal Board of Revenue' and 'Pakistan International Airlines' respectively.

ICT skills. Hence those officials were not capable of making any effective use of a range of computer and internet related applications such as working with different MS-Office programs, preparing and delivering multimedia presentations, maintaining email correspondence, data sharing and transferring documents through internet, effectively web browsing, efficiently data searching and filtering as per requirement, and organizing meetings through audio/video conferencing.

The excessive use and dependence over ICT based systems and applications for the decision making processes has been critically viewed, as considering ICT potentially a risky and distrusted means of communication. The predominant presumption was that the ICT-based systems could easily be corrupted and forged without having any specific person to hold accountable for. Hence, even in the presence of these systems, they presume that a parallel manual file system is still required to be working for some time, until the transition towards a full-fledged ICT-based system effectively takes place. It was argued by some senior bureaucrats that at a higher scale of policy and strategic debates; the use of multimedia based presentations are less effective, since such multimedia presentations (in their perspective) only cover the apparent and superficial discussions, whereas the detailed information can only be preserved within those bulky backup files and the piles of documents essentially saved in 'hard copies'. These senior bureaucrats also comment that the manual style of file record management cannot be corrupted so easily; whereas it may possibly go unnoticed in case of a computerized stored data.

Nevertheless, they do believe that the ultimate destination is a full transition towards the ICT based e-governance and e-administration systems. However, it was clarified that it would still have to pass through an evolutionary process in several incremental steps; hence, an expectation for a radical change or a rapid adoption of these ICT processes within the bureaucratic procedures and the established routines would be simply out of the question at this stage. In light of the above discussions; the author presumes that the above presented situation doesn't pave the path or even indicate any sign for a determined and conscious effort committed by the relevant authorities with respect to rapidly moving towards the stated slogans and the envisioned future for e-governance and a paperless e-administration model, which can be now commonly observed in developed parts of the world.

In the above context, the telecom regulator (PTA) assumes its own organization an exemplary case with reference to the effective use of ICT facilities for the secured exchange of information. On the contrary, PTA considers the new web-based system recently implemented by Federal board of revenue (FBR) for tax collection as a very complicated and cumbersome online system, especially from the common users' perspective. Hence, the regulator insists that the public and private organizations should not make their web-interfaces so difficult that the common users eventually decide not to use those online applications at all, just out of frustration; and rather decide to switch back to the old manual style of case handling procedures through personally appearing at their offices. Even in the relatively modern banking sector as well, although the e-banking and m-banking concepts and applications do exist on papers or at the prototype level to a limited scale; but the mass scale adoption of those online applications are still presumably miles away from being

publicly acknowledged, in terms of their usage among the general masses. However, some academics refer to a recent development about the emplacement of online judicial system; where one can easily follow the status of a case by logging into the online account of that particular case. Along with many other reform processes adopted within the judicial system during the past years, this particular initiative has been considered as very helpful in expediting the capacity of Court's proceedings and its ability to swiftly handle the registered cases.

### ***The Critical Analysis of 'Senior Bureaucrats' on the Usage and Impacts of ICT Services***

Two senior civil bureaucrats were interviewed in detail to collect their responses and evaluation regarding the potential impacts of ICT services on the performance and work processes of the bureaucracy. One of the bureaucrats was a regular user of ICT services with respect to his official work, whereas the other was not very fond of working with the modern ICT services; hence their responses were a bit mixed of both flavors, which actually bring a sort of conscious and critical perspective about the new ICT-based changes within their work environment.

As per the interviewees feedback, the resulting impacts of the use of the different ICT applications (particularly the use of computer and internet) on the bureaucratic work is essentially no more than performing some clerical jobs like typing and printing stuff, and occasionally some email correspondence. Besides appreciating some facilitation that ICT services bring to their work environment; they also looked critically at the observed impacts of ICT on the clerical competencies. The reason was told that in past when typing had to be done manually, the typists were generally found to be quite conscious about their language; hence they were supposed to keep themselves updated in order to avoid any spelling or grammatical mistakes. In comparison, the current draft-makers and typists have been called less competent and relatively careless, because of an increased dependence on the computer programs (such as MS-Office). The second use of computer has been called the information access from internet in the office working environment; however, here again the problem remains in dealing with the issue of 'information explosion' i.e. too much but mostly irrelevant information that appears on screen in result of using the search engines for information, and that requires an extensive amount of filtering job to sort out the relevant and required information. Therefore in their opinion, an untargeted and unfocused search (if the person is not trained in data searching and filtering) may result in both the wastage of time and resources (particularly when the searched documents are to be printed as well). Hence, they argue for a proper training program for the office staff in order to train them in learning the skill of targeted data searching, sorting and filtering, and accordingly finding patterns for further data analysis; instead of just providing access to these ICT facilities within the office environment.

Couple of the interviewees (senior bureaucrats) presented an interesting analysis about the adoption process of a new technology in a society, which is also in line with the theoretical insight of this thesis. They explain four different stages of the growth and development that require to be followed in a sequential order without ignoring any middle stage, as perceived them. In the first stage, the society is assumed to be relatively unaware of the different uses, applications and potential benefits of the new (esp. in case of a 'radical') technology; hence in that stage the society has been named as

a 'primitive society'. In the second stage, the society acquires some basic information about the new product or technology; thus it starts preparing itself for the taking-off stage in order to adopt the new technology, so this stage has been called the 'preparation for the takeoff'. In the third stage, the society actually takes-off and then observes economic and industrial growth by producing relevant products as a manifestation of successful preparation for the gradual transition towards the adoption of new technology; hence the society turns into a 'producer society'. In the fourth and final stage, the society prepares itself for the mass consumption (i.e. the mass scale diffusion and adoption) of those new technological products. At this final stage, the process of adoption eventually completes and the society as a whole effectively adopts the new technology for different productive applications. Summarizing the discussion, the transition towards mass scale product diffusion and adoption in a society essentially composes of four subsequent stages namely: the primitive stage of ignorance and unawareness; the second stage of the necessary preparation for the take-off through learning, education and market awareness; the third stage of capitalizing on the economic and industrial growth through mass production; and finally the stage of a mass scale effective diffusion and adoption of the produced goods and services by the society.

However, the author adds on an important fact here that the above discussed 'four stage model' essentially fits well for the producing nations; but as a matter of fact most of the nations in the world are rather the 'consumer societies', due to missing the scale of competencies and resources required to independently go for in-house production of the new technological products. However, in case of Pakistan, this model may potentially work if the leadership is committed for the fair and productive use of the available resources; since the country is not lacking the required skills and competencies. Moreover the country is also blessed with a huge land area and the essentially required large labor force, since the number of youth population composes around 60% of the total population. The country is also not short of highly skilled labor force, since as a matter of fact a large number of Pakistani expatriates are quite visible in many parts of the world, working as engineers and technicians within different industrial sectors of the developed nations.

The interviewees argue that in case of the Pakistani society, and particularly in case of the diffusion of ICT products and services; it seems like the two significant middle stages i.e. the stages 2 and 3 (as per the above description) were skipped in between, and the society has been directly pushed from the stage 1 of utter ignorance to the stage 4 of mass consumption of those 'imposed' products and applications with the support of crazy media campaigns. It has been viewed that this irrational jump has created a 'vacuum' in the patterns of the effective usage and consumption of those services. It is because the society has been directly turned into a 'consumer society' without having produced anything, or not even being sufficiently educated and trained enough to have effectively used those technologically pushed or exogenously imposed services within its own specific social and cultural context.

It has been further argued that people have been observed generally afraid of adopting any 'change' because of the difficulty in crossing the 'psychological and learning barriers' as we commonly observe in case of all technological products. Hence, they argue that the diffusion of ICT services

would also follow the familiar S-shaped adoption curve, and people would eventually adopt these services as soon as they are able to cross the existing mental and technological barriers after having found the ICT products and services relevant, usable and affordable within their own context.

The consequence of ignoring the middle stages of adoption can also be observed in terms of the usage pattern, as further explained by the interviewees. For example, consider the three specific usage patterns such as: in case of its 'misuse' (in terms of immoral or unethical usage of ICT services); the 'excessive use' (e.g. calling to someone in very short proximity, sometimes even to someone sitting in adjacent room, or chatting/messaging/talking to someone unnecessarily for very long hours); and the 'haphazard use' (e.g. becoming the victim of 'information explosion' and the 'syndrome' of endless 'social networking', thus causing both the waste of time and other social issues as well). It has been further argued that the abundance of digital gadgets in an average household, and its excessive and random usage has also considerably raised the expenses of a common man. Hence, the increased expenses due to the excessive use of these products and services have arguably forced us to find additional means of income in order to meet those mounting expenses. In result, it has become one of the reasons for the existing frustration in the society, where everyone is struggling to maintain ones position in an on-going 'social status' competition. But on the other hand, the interviewees also acknowledged the fact that these ICT devices and services had considerably improved the work efficiency in terms of saving time due to having an unprecedentedly quicker and increased access to different information sources and communication links. However, it has been strongly debated by them that due to having skipped the two intermediate stages of the growth and development process during the adoption and transition towards new ICT technologies; there have been observed relatively more negative impacts than the positive ones in result of following the immature adoption of these services.

Reflecting on the impacts of the ICT implementation for combating with the corruption and ensuring transparency particularly within the bureaucracy of public administration; it has been debated that corruption is a 'state of mind', which nevertheless prevails and finds its way to sneak out anyway, even in the presence of a strictly scrutinized ICT-based supervisory or monitoring system. Hence, if an individual mind is not corrupt then the corruption may have been avoided even in the manual systems as well; but on the other hand, if the minds are corrupt then even a full-fledged supervisory system cannot detect the guilty persons on its own, since ultimately it is the system's operator who controls the inputs and outputs of the system. So, the ultimate judgment and final impact (whether positive or negative) is in the hand of ICT system's operator who subsequently follows the instructions given by the controlling or decision making authority; hence, the ICT-based supervisory systems on their own cannot ensure the 'transparency' element in any society. Therefore, it has been further argued that the corruption and transparency are tightly linked with the prevailing moral and ethical values, rather than with the adopted means and implemented procedures. Again, it has been insisted here that corruption is a mental status which more likely proliferates in an environment where the society starts increasing the scale of its necessities and requirements (i.e. the materialistic consumptions) beyond its legal means and the actual capacity of earning (or production). This mismatch arguably results in creating an unbalance within the

collective living style and the social attitude of a society; which eventually leads to an economic stress and a risk of further exploitation and corruption. In a corrupt mindset or a society 'the excitement rules over the confinement'; and hence to counter the corruption, it has been argued that the moral values should primarily rule over the procedural practices.

In this context, an example was quoted by the interviewees of a local minister's classical style of execution who wanted to protect his own vested interests through manual induction of corrupt data in the computerized system of BEMIS (Balochistan Educational Management Information System), which was implemented in the province of Balochistan for awarding the funds for educational purposes to different constituencies. The award system was based on the number of existing schools in each district. Thus after adapting the new computerized system, the fund allocation was supposed to be done automatically based on the data already fed in the system, in order to make the process more transparent. It was told that the local educational minister wanted it to be done other way round as per his interest in order to allocate maximum funds for his own electoral constituency. So he forcefully asked the system operator to change the fed data in order to achieve the desired outcome in line with his own vested interests. Hence, it proved again that despite the presence of an efficient computerized system, the system transparency cannot be guaranteed due to the risk of undesired manual intrusions by the higher authorities, using system operators as their instruments.

However, one of the interviewee referred to a success story in case of the government's tax collection department FBR (Federal Board of Revenue), which has significantly increased its tax-net over the years through implementing computerized systems at all levels; however, an independent inquiry yet remains to be conducted in order to verify the authenticity of the claim. It is because some circles openly question the presence of transparency element in the FBR operations within the media reports, while accusing FBR for being involved in an annual tax leakage of an amount scaling up to Rs. 500-600 billions; however, that accusation was later denied by the chairman FBR in a press release<sup>83</sup>. While telling about the success story, the senior FBR official insisted upon the gradual adoption of new technologies in the organizational processes, saying that initially the organizations are likely to experience some flaws and defects in the implemented systems. It is because the newly implemented systems go through under the trial processes for some time, as being critically experienced by the initial adopters; hence, an optimal performance from the newly implemented systems cannot be expected right from the beginning. But as the time passes on, and the new system and its adopters mature after going through the mutual learning and adaptation process; the performance and efficiency level of both the system and adopters gradually improve and the suspected leakages are also controlled over time.

Sharing the experience of the collaboration with NADRA (National Database & Registration Authority) for accessing the computerized data of the total population; the FBR official mentions that initially there were found many leakages and gaps in the implemented system, but gradually they were significantly improved. It has been told that the role of the computerized data collected

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<sup>83</sup> [http://www.dailytimes.com.pk/default.asp?page=2010%5C12%5C03%5Cstory\\_3-12-2010\\_pg5\\_5](http://www.dailytimes.com.pk/default.asp?page=2010%5C12%5C03%5Cstory_3-12-2010_pg5_5)  
(Accessed on Dec 8<sup>th</sup>, 2010)

and organized by NADRA is getting an increased acknowledgment from other government departments, particularly in case of FBR that aims at increasing its tax-net. NADRA has been generally considered as one of the exemplary case, which successfully managed to register the huge amount of computerized data of the whole population (despite some minor irregularities that have been encountered at occasions); and it has delivered its expertise and services to other regional countries<sup>84</sup> as well, who were also inspired by the department's successful experience in Pakistan.

### **10.2.2 ICT Impacts on the Academic Sector**

This sub-section covers the observed and the stated impacts of the use of telecom services both at an individual and institutional level. At an individual level, it has been generally observed during the visits of several academic campuses across the country that there was very low tendency among the students (even not at the university level education) to carrying their own laptops while roaming around the campus in order to remain connected with internet using the campus-wide wireless networks, which was expected to have been provided by the university administration. However, the limited use of laptops has been primarily referred to the affordability issue, since it costs much higher than a desktop computer. On the other hand, the wireless internet connectivity across the whole campus was also not that common to have been found, particularly in the public institutions. Generally it has been observed that the students compensate this lacking of wireless internet connectivity and access to the laptops through wireline internet connections using desktops at their home or at the university facilitated computer labs, as they provide the shared-mode internet access.

On the other hand, the academic and administrative staff were found commonly using emailing service for their personal correspondence; however, email has not been officially recognized as a trusted communication medium for the exchange of official documents, giving the same line of argument that internet is generally considered as an unsecured communication medium to be used for the exchange of classified information. Similarly, all the official documents that require personal signatures are still exchanged manually or by post. Interestingly, fax has been considered as relatively more trusted medium for the exchange of official documents, since there is no such risks involved of data being corrupted during the exchange of information, or the system being hacked by an unknown intruder (as observed in the recent case of WikiLeaks' disclosures). Hence, the academics and university administrators were also raising their concerns about the data security issues involved in the exchange of official and classified information through internet.

At the organizational level, the implementation and adoption of ICT-based learning systems within the educational campuses has not been considered a success story by the respondents; particularly when evaluating the diffusion of ICT from the perspective of relative change it has brought and the resulting impacts' it has created within the academic environment. The 'distant learning' initiatives, such as arranging online educational and training programs including the online lectures from anywhere across the world using video-conferencing facility; and the 'web-based course management' practices were found still in the planning phases in most of the universities.

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<sup>84</sup> [http://www.nadra.gov.pk/index.php?option=com\\_content&view=article&id=19&Itemid=29](http://www.nadra.gov.pk/index.php?option=com_content&view=article&id=19&Itemid=29)  
(Accessed on March 6<sup>th</sup>, 2011)



Furthermore, often no clear deadlines were either given to ensure the final timeframe for the possible implementation of the planned e-learning initiatives. The idea of introducing the concept of 'communities of practices' among the faculty members, and between the academic and industrial research communities across the country to share their research and academic experiences with each other on the routine basis, has been generally appreciated. However, so far no such serious and result-oriented initiative has been yet seen committed by the local academic or industrial research communities towards creating such online 'communities of practices', for the mutual benefit of both the academic and industrial institutions.

It has also been observed that due to the lack of any proper training given to the administrative and academic staff, they were generally found quite dependent on the IT staff and data administrators in understanding and effectively making use of the provided IT facilities. In this context, the author considers that the provision of IT facilities and building of the hardware capacity have to be essentially coupled with the development of relevant contents and applications, and also with fostering the basic IT skills and competencies among the academics, administrative staff and students; so that they could get maximum benefit and extract the real worth out of the available IT facilities for their respective educational activities within their academic premises.

#### ***Background Analysis - Recommendations to Create ICT 'Demand-Side Economies of Scale'***

It has been observed by the author that the prevailing educational system in Pakistan is largely based on the 'spoon-feeding' approach, where the students are generally given a preset reading material (or the preparatory notes) in order to be learnt by heart. The students' memory is then tested in a written exam of 3 hours duration through a random selection of 5 questions from the assigned material. However, arguably this system of learning doesn't put any significant research obligation or an analytical responsibility on the student's shoulder to conduct an independent inquiry for the relevant work done by the other scholars within their individual research disciplines; in order to broaden their knowledge base through making an effective use of the online databases and e-libraries. This challenging and probing practice of throwing the students in the ocean of knowledge to let them find the pearls of insights for themselves, would expectedly produce more independent thinkers and critical scholars, who would likely have higher capacity to contributing their part of knowledge with the global research communities.

Furthermore, it is recommended here that in addition to introducing an 'open-book' pattern of written examinations, the students should also be frequently examined through 'oral-exams' by giving them opportunity to apply their knowledge and the gained insights on different presented situations and created scenarios. It is assumed that such system of learning would be relatively more suitable for the disciplines of law, theology, humanities, social science, economics and management studies. Moreover, the facilitation from the university administration in swiftly introducing effective and well-functional virtual educational facilities and the web-based course management system would be an important step ahead towards adopting the e-mode education. However, needless to mention the fact that realizing an effective implementation and adoption of the above proposed system of learning and education would essentially require that both the faculty members and the

students should have been provided some basic training facilities to help them smoothly adopt and adjust with the requirements of the new educational system.

In the above context, the author also suggests here that a ‘research board or committee’ should have been established within each university, which should dedicate itself to help out the teachers, researchers and students in their search for the most relevant journals or publishers to publish their research papers and books, by making an effective use of ‘ISI search index’<sup>85</sup> and by also employing their own global academic and social networks. This would definitely help them learning the skills of making research publications (i.e. books, research papers or conference papers) in order to enhance their ‘impact factor’ for an increased academic recognition. Moreover, making a defined number of research publications may also be made as an essential part of the students’ qualification criteria to pass a graduate or post graduate level study program. It is assumed that by following the above recommendations, it would not only improve the learning and research capability of the individual researchers & students, but would also enhance the international ranking and visibility of those universities in the academic world. Most importantly this would help creating a new educational research culture, & would also create the desired ‘demand-side economies of scale’ for an increased appetite for the repetitive and productive use of ICT facilities within those institutions.

### ***The Reasons for the Slow Adoption of ICT Facilities and e-Mode Education***

The author deliberately floated a range of assumptions in front of the respondent to stir up the discussion and tantalize the debate from different dimensions. The aim was to dig out the major reasons behind the slower adoption of ICT facilities and e-mode education in the academic sector. For the readers’ convenience, the lists of raised questions as posed by the author are presented here.

First, is it due to the lack of financial resources to implement the envisioned ideas? Second, is it due to the lack of administrative and academic competencies to effectively make use of those modern ICT facilities within their administrative and academic activities, in order to enhance their academic performance? For example, in case of the teachers, is it because they are perhaps either not used to with or don’t feel comfortable with preparing their presentations (lectures) on different Office applications such as PowerPoint/Excel/Word, delivering their lectures on the multimedia, uploading their presentations and lecture notes on the course webpage, uploading assignments and updating schedules for different events and activities, and organizing the course webpage regularly? Third, is it due to the lack of relative awareness and training among the students in order to make an effective use of different ICT applications for their learning, information sharing and knowledge acquisition processes, during and after the campus hours? Fourth, is it due to the lack of willingness and personal interest on behalf of the students, or due to the absence of any felt need to make regular and frequent use of ICT services and application for their educational purposes, because perhaps the overall academic environment provided by the teachers and administrators doesn’t really require them to make any frequent and effective use of ICT services and facilities? Fifth, is it due to the

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<sup>85</sup> ISI Web of Knowledge is the world’s most acknowledged search service used for the indexing of academic citations. It provides bibliographic contents and the tools to access, analyze, and manage research information, and based on these citations the academic ‘impact factor’ of individual authors, journals and universities are calibrated.

lack of technical expertise on behalf of the content developers, programmers, system architects and technicians in efficiently implementing an appealing and scalable system tailored with the requirements of the specific campus, in order to ensure the optimal use of the deployed network resources?

Sixth, is it due to the lack of a strategic vision and workable policy on behalf of the government, official bodies, and academic heads of the different institutions? Seventh, is it due to the lack of 'social capital' factor that essentially include: missing to have any common goal or objective with a common source of inspiration; the lack of mutual trust, sincerity and commitment; and substantially lacking a genuine dedication and devotion for a spirited cause with a broader agenda? Eighth, is it due to the inherent malfunctioning of the managerial processes and administrative functions, because of the prevailing mismanagement, corruption and lack of transparency? Ninth, is it due to the lack of proper planning and strategic formulation in the implementation of the delivered vision and ideas, which perhaps result in unexpected or unwanted outcomes, as not initially desired or aimed at? Tenth, is it due to any procedural or regulatory barrier that potentially retards the effective use of ICT services in those academic premises? Finally, is that because of experiencing some sort of social inertia or cultural barrier, e.g. faced with an unwelcoming social attitude towards the use of some particular ICT services in specific contexts?

Though, the interviewees actively debated the different issues as raised above by the author, but apparently it seemed like they were somewhat equally insisting on the relative importance of the discussed issues in connection with the slower adoption of ICT services within the academic sector, during their verbal explanations. Hence, the author couldn't really find any specific pattern out of their discussions to quantifiably conclude their debates in terms of presenting the different issues within the chronological order of their perceived importance from the discussants' perspective. Hence, the author suggests here that the simultaneous use of deploying both the quantitative and qualitative research methods would likely bring better results in terms of finding out a clearer pattern about the most significant reasons for the slower adoption of ICT facilities within the academic sector, as perceived by the respondents in a chronological order.

### ***The Role of HEC (Higher Education Commission) in ICT Diffusion within Universities***

HEC acts as a regulator for the university level education, which has been primarily held responsible for implementing the policies set by the ministry of education. HEC acts as a buffer between the university administration and the ministry. Regarding the low ICT diffusion in the educational sector when compared with the developed countries, the academics argue that here ICT has been conventionally considered as merely a supporting tool and not like an emerging phenomenon on itself. The government allocates budget each year and the procurement officers within the different public sector institutions buy the ICT infrastructure, hardware, and the supporting software and operating systems. During this process, arguably the supply side economies are not fully coupled with the demand side economies in terms of the real requirements and the consequential impacts of those procurements for the targeted user groups. It has been further commented that there has been yet no proper and thorough study conducted so far with the

help of a detailed consultation with all the relevant and interested stakeholders in order to carefully evaluate the basic rationale of the spending scheme (i.e. the 'cost structure') with respect to the list of possible applications of the deployed ICT facilities and of other committed resources within the university premises; hence, to assess their relative effectiveness and the resulted impacts in reference to the expected or desired results. Thus, it is expected that a better assessment would result in a coherent scheme for the resource allocation regarding the provision of ICT facilities, both from their effectiveness and the resulting impact's perspective.

Responding to the question, whether there has been issued any policy paper by HEC to the universities that declares some clear goals and milestones as guideline for the effective implementation of the envisioned e-educational and e-administrative systems within the academic premises; the academics reply that HEC is somewhat moving in this direction, but may be not yet that effectively in terms of the resulting impacts of the taken initiatives. It has been told that HEC has recommended a policy framework to equip all the university campuses with the high speed fiber internet connectivity and state-of-the-art IT facilities in order to enable them making an effective use of different ICT applications; such as video conferencing, distant learning, online databases and web-based course management practices. The project has been named as PERN (Pakistan Educational Research Network) which was initiated in the year 2002, with the aim to connect all the public and private sectors' academic and research institutions with each other over an IP-based infrastructure through a metro fiber ring (Gigabit Ethernet). However, the provision of connectivity, capacity building and infrastructure provision has been considered as only one side of the story; whereas these supply-side initiatives regarding the provision of ICT facilities practically remain an inconclusive effort unless the effective and productive use of these facilities within the academic context has also been ensured by HEC and the respective university administrations. The author assumes here that until this existing gap between the supply and demand-side efforts has been filled out with the collaborative efforts between all the involved stakeholders; merely the deployment of resources for the provision of hardware infrastructure and ICT services would be simply waste of resources, since the outcomes and the relative impacts of these deployments would not be then in line with the desired objectives.

### *The 'Virtual University' Experience*

A virtual university exists in Pakistan under the auspices of HEC and the federal government to facilitate affordable educational facilities to particularly those students who are unable to attend the regular campus-based universities for any reason. The university was opened in the year 2002 and in a short span of time its outreach has expanded to over sixty cities across the country with more than a hundred associated institutions providing infrastructure support (as affiliated branches) to the students. However, it has been debated by some respondents that the higher dependence on e-mode education in a virtual university is apparently insufficient to fully replace the effective learning experience that takes place within the campus-based universities. Hence, it is assumed here that probably the best learning take place when the e-learning practices are used as the complementary mode of education to support and reinforce the traditional style of educational activities at these campus-based universities. The courses offered by the virtual university have been called quite

impressive and updated. However, the factors like the lack of experiencing face to face interaction with the teachers and peer students, the missing element of a stimulating academic environment, and the lack of transparency element (such as validating the original authorship and effectively handling with the plagiarism issues in case of online submission of assignments and projects) may pose serious questions, when considering a full-fledged e-mode educational system as an alternate or a complete replacement of the formal educational system.

### **10.2.3 The Socio-Political and Economic Impacts of ICT Services**

The telecom operators highlight the significant changes and impacts that the use of ICT services has brought in the general public's life in terms of increasing their general awareness, experiencing an unprecedented connectivity, the observed changes in their social life and attitude, and with respect to the newly created economic opportunities in result of the diffusion of ICT services over the past few years. The operators quote some examples in this context. First, they observe that today even the common laymen like a mason, plumber, barber, transporters (including taxi drivers), carpenter etc. can now handle all of their clients while on the move by using their mobile phones, instead of being fixed at the physical locations. Hence, now their mobile phones have literally become the primary point of contact and the fundamental communication source for most of their economic activities. Giving another example, the fishermen and farmers can now first confirm the market prices; instead of carrying their stocked fishes and crops spontaneously to different markets; considering the fact that sometimes these markets are located even hundreds of kilometers away from their original locations. Secondly, the direct impact in terms of employment and creating new economic activities is also obvious from the fact that thousands of people have been either directly employed or they found new earning opportunities in result of the development, deployment and diffusion of ICT infrastructure and services in Pakistan. The operators have hired directly or indirectly (through their sub-contractors) the services of thousands of people for building infrastructure, making installation and doing maintenance of the cell sites and towers, selling services, and providing the necessarily required transportation and logistical facilities.

In addition to that, people were also being paid for renting their private spaces for the installation of cell sites and establishing offices, which created additional economic opportunities. As mentioned earlier, the media also got extremely benefited from the marketing ads of telecom companies, especially during the past decade. It was also commonly observed across the streets everywhere that people were selling the mobile connections and reloading the prepaid balance as middlemen. The huge number of fixed line (and mobile) PCOs or pay-phones and the internet cafés delivering shared-mode ICT facilities to public are another manifestation of ICT impact in terms of generating economic activities. In past times, people were used to go miles away particularly in the rural areas just to make or receive a phone call, but now having access to mobile connections across the country they have the possibility to communicate with anyone, at anytime, and from anywhere relatively at quite economical rates through using their own personal gadgets.

During the observation of the impacts of the computer usage and internet applications on the performance of two practicing medical doctors (physicians); the physicians shared their experiences

by telling their personal narratives about how they started interacting with ICT services. Their stories tell that initially when both doctors were unaware and afraid of using computer and internet; they were quite skeptical and cynical about the usefulness and relevance of internet with respect to their profession. But once they were properly introduced to the computer and internet usage and a range of its associated useful and relevant applications, they gradually came over their initial fear and hesitation and thus crossed the mental barrier (i.e. the 'social lock-in'). Consequently, they were totally amazed by seeing the potential benefits they achieved in result of an effective use of ICT services within their profession. One physician did engage in effectively retrieving the required information from different online databases and information sources across the world, which made him capable of publishing two research papers in relatively very short span of time; while the other physician found internet immensely helpful source during the disease diagnostic process of his patients (especially when he was serving out of the station in rural communities) through consulting international databases, and by communicating and sharing patients-related information with his colleagues practicing across the country, hence establishing his own 'community of practice'.

However, on the flip side, there are many negative aspects as well to be highlighted here briefly again, but from new dimensions in order to complete the discussion. Keeping apart from the moral and ethical issues and concerns associated with the misuse of ICT services, which we have already discussed sufficiently; the following discussions would highlight the other important aspects associated with the excessive and misuse of ICT services on our social life. The respondents reflected on different issues, while also giving examples about the observed patterns of ICT usage in their surroundings. It has been acknowledged that the current scale of felt need for the continued communication and connectedness; and in result the increased dependence on different ICT gadgets and services is unprecedented. Explaining further the fact, they argue that before the advent of mobile and internet services, people were not that touchy and conscious about continuously knowing the most recent updates of their friends and family members, the way as they are observed doing now, as commonly reflected from their attitude towards uninterruptedly using these services. Some years ago, it was common to see that people could have easily waited until they had reached to their work places or even got back to home in order to communicate with their friends and family members regarding their personal matters; however, now it is unlikely to see someone not keep calling to their personal connections even when they are travelling back and forth and often by calling to the same person several times in a row.

This increased frequency of communicating and the surging need to remain connected with the friends and family members has been considered as among the major reasons for the increased laziness and the observed anxiety in our collective attitude. Consider the cases where we observe someone calling to someone else sitting right across the wall in an office, or even within a home either upstairs or downstairs, instead of physically going to see that person; and similarly calling twice or thrice to a person in average for delivering or exchanging a single message or information, when calling only once was assumed to be sufficient for a comprehensive talk. It has been assumed by the author that sooner or later we shall also observe the same level of communication, connectedness, and increased dependence on internet as well at the societal level; once the basic



tenets and the essential attributes of the successful diffusion (as observed in case of the mobile services) are met. We already witness and experience this phenomenon within the broadband connected communities, particularly among the educated youngsters of urban populations.

In a TV show broadcasted by a private channel in Pakistan, the program host highlighted an interesting fact which is summarized here for the readers' convenience. In the past times, the fixed phone with one connection emplaced in the corridor for the whole family usage, or a single TV placed at the TV launch had often provided an opportunity or occasion for the family meetings, as the family members were used to frequently see each other time and again; hence, having an opportunity to spend some time together to discuss the mutual concerns, and so it essentially helped increasing the family bonding and ties. But ever since the internet (esp. in case of internet access on the laptops) and mobile phones have plunged into our individual lives, we are increasingly getting distant from each other. Thus, the relative occasions of communal gatherings on the daily basis have also been observed severely decreased in result of our individual possessiveness with these personal gadgets. It appears now like our homes are turning into decorated hostels, where everyone is more pleased to live and spend time in his own room (individual space) in order to preserve or maintain his/her privacy at the cost of communal gatherings and family bonding.

In this connection, it would also be relevant to present the translation of an Urdu article published at the Urdu blog of BBC (British Broadcasting Corporation) by its local correspondent<sup>86</sup>. That journalist visited different parts of the country asking youngsters of relatively posh areas to know what activities they actually love to be engaged with these days to spend their quality time. This summary of the story primarily includes the correspondent's observations, but it also includes the author's own observations at occasions. The BBC reporter quotes the story saying that: "Some days ago, I went to Karachi (the largest city of Pakistan) to meet some families in order to investigate from the youngsters what they were doing these days and how did they spend their casual time in daily routine. After giving a playful smile, most of them replied by asking me; whether if I were really interested knowing the fact? And I shook my head in affirmation, as reporter continues; so they replied again ['Well, if we say truly then most of the time we remain bogged down in surfing Facebook and the other social networking websites; and looking for the entertainment news both at the school and during the work hours, and even when we are back to home as well. We check the updates for each others' most recent 'status' on the Facebook even after short intervals. We press the different links and tags such as 'like', 'comments' and 'share' for showing our likeness with additional comments; and then sharing photos and messages with other friends present in the list. Then we look at the pictures of the friends of our friends and their friends, so on, so on... we pass some comments and then write on our current status, e.g. what did we eat today in the breakfast or lunch or any other funny stuff experienced today. Then we wait for the comments to be received back from our friends for some time; and if someone didn't comment on our comments or on the uploaded photos then we apparently become sad, and actually often get frustrated if being ignored or having received a disliked comment. Then we start chatting with different friends to set plan for

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<sup>86</sup> [http://www.bbc.co.uk/blogs/urdu/2010/09/post\\_672.html](http://www.bbc.co.uk/blogs/urdu/2010/09/post_672.html) (Accessed on January 12th, 2011)



meeting in some coffee shop during the evening hours. While sitting in the coffee shop, we start making jokes and laughter on others' status on the facebook. Then we make pictures of each other using our mobile phones to be uploaded at Facebook later on, when we come back to home in the late evening. After some time we check the status again and if someone had not made any comments or didn't 'like' yet those recently uploaded pictures, then we start calling at their mobile phones to ask why not did they like or passed any comment so far on their status at the facebook']. Following that, the author observes that during the late night hours, they start gossiping again using their mobile phone to get benefit out of the free night time calling packages, and also to make use of an extensive amount of text messaging service to exchange a chain of endless comments."

This is a small reflection of the typical life style of the educated class of youngsters and students, particularly in the urban areas; which could be now commonly observed. The author asks the readers at this point: Whether would it be considered a productive use of ICT services? Whether the 'desired' and the 'resulted' impacts of these services on our social life do show a substantial degree of variance, to be profoundly thought about? Whether this sort of life style and the specific pattern of ICT usage would be appreciated by the parents, elders and teachers as watching their kids, youngsters and students respectively totally being occupied, absorbed, obsessed and fully engaged with these ICT gadgets and services, while being at school, work and even back to home as well??

The author views that sometimes a technological 'virtue' itself becomes a 'curse', if not appropriately handled. For example, in case of the internet service, the frequent and extended information 'accessibility' was initially considered as a technological virtue; but now we have reached to a stage where this phenomenon has turned into an 'information explosion'; and where the real challenge is not about accessing or retrieving the information (as it has been the case in past before the advent of internet), but it is to sort out the selected and required information from the millions of pages that immediately appear on the screen as we make use of the 'search engines'. There are about more than 200 million websites, as estimated by 'Net-craft'<sup>87</sup>(est. 2010). Hence, now the real concern is to rather discard the irrelevant information and the junk stuff, when searching for the most relevant and worthy material for further analysis.

The omnipresent and ubiquitous connectivity, which is commonly considered as a blessing i.e. to remain connected and accessible to anyone, anytime, and from anywhere has now literally become a real headache for many people, especially for those who are increasingly concerned about maintaining their privacy, due to being frequently and extensively in reach of others. They feel being under the obligations of mutual responsiveness (i.e. the interexchange of communication under the sense of 'reciprocity'), which often makes them overwhelmingly occupied both in terms of their consumed time and focus. On the other hand, people are now increasingly getting dependent on different ICT gadgets and services in order to run their daily life activities at a level where one cannot even imagine being disconnected or detached from its 'connected world', sometimes not even for a single day. This is especially true as observed in case of the developed

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<sup>87</sup> <http://www.caslon.com.au/metricsguide1.htm> (Accessed on January 5<sup>th</sup>, 2011)

countries, where almost all sort of communication takes place through these information and communication gadgets. Ironically speaking, this is the 'price' one has to pay for being blessed with this increased 'connectivity'.

The external environment also plays a critical role on our increasing dependence on different ICT gadgets and services because of the expansion of works, and seemingly an unending list of tasks and responsibilities, which are due to be accomplished in relatively shrinking amount of time. However, there is an increasing sense of insecurity as well among the people, particularly in the presence of currently experienced volatile law and order situation; which even further enhances the need to remain connected all the time with the family members, personal friends, colleagues and other relatives. Hence, there seems to be an ongoing 'tension' between the cause and effects of this phenomenon. At one hand, there is an acknowledgement for the perceived usefulness and the benefits of the increased connectedness, but at the same time these gifted benefits seem to be wrestling with the feeling of guilt for excessively being occupied, mentally being distracted, privacy being violated, and emotionally being detached with the people living in our immediate vicinity. Hence, concluding the debate with the comment that the 'art of balancing' is ultimately in the hand of the user itself to decide how to make best use of the technology, since the technology itself is like a fluid which takes the shape of any vessel within which it has been contained.

On the political front, in terms of creating mass awareness among the people to raise their voices for their civil rights; it can be vividly observed that the effective use of ICT has now getting the central role in all political campaigns, particularly against the ruling regimes since the state media (TV broadcast) is still in control of the government. Hence, the campaigns for the public demonstrations are increasingly organized through effectively utilizing other communication channels such as TV and newspapers, but now increasingly the cellular and internet services as well. It has been informed that the governments had attempted several times to curtail the use of text messaging and internet for the political campaigning purposes, particularly against the government policies e.g. by raising the taxes on SMS, shutting down some websites, and restricting the use of particular web applications.

However, in the regional perspective, recently the Tunisian and Egyptian revolutions were reportedly led by primarily the effective use of internet. Some examples have been given here as quoted from the media reports. In the first case, it has been frequently quoted that the revolutionary Tunisian song<sup>88</sup> released on internet (as uploaded on YouTube and Facebook) was eventually banned by the previous tyrannical regime and the 23 years old young rap singer was put behind the bar. However, his revolutionary song changed the whole nation and resulted in the famous 'Jasmine Revolution'. In the second reported case, two Google's executive employees open a page on Facebook against the tyranny and brutality of the Egyptian regime<sup>89</sup>, which eventually became a symbol and source of inspiration for the Egyptian revolution; and the effective use of internet

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<sup>88</sup> <http://www.youtube.com/watch?v=IeGIJ7OouR0> (Accessed on Feb 11<sup>th</sup>, 2011)

<sup>89</sup> <http://www.ft.com/cms/s/0/e41c5faa-3475-11e0-9ebc-00144feabdc0.html#axzz1DdvN4Fki>  
(Accessed on Feb 11<sup>th</sup>, 2011)

significantly helped in mobilizing the crowds in millions on the streets within short calls. In retaliation, the previous Egyptian regime shut down the whole countrywide telecom infrastructure out of the fear that it might endanger the stability of that autocratic regime; however, eventually it was destined to collapse despite creating all those blockades on different information sources and communication means of the country.

Samarajiva, R. (2011) refers the recent toppling down of the Mubarak's regime in Egypt in his comment<sup>90</sup> as the affirmation of 'Gyanendra's Law' that states that "a government that shuts down its entire national telecom network does not survive". However, the validity of this law has yet to be further testified e.g. in other cases of the recent uprisings as observed in rest of the Middle East and North African countries against their ruling regimes; since many of these regimes (e.g. Libyan, Yemenis, Bahrainis and Syrian) have also reportedly enforced a complete telecommunication blackout in order to keep the rest of the world unaware of the ongoing political events happening inside those countries. However, in case of Pakistan, the country has not yet experienced that scale of political impact of different means of information and communication sources (particularly the effective use of mobile and internet services for the political campaigning) that could substantially empower the public voices for their desired change and reform within their political, economic and social setups, through a constructive and democratic process of building mass-opinions. However, the author foresees that studying this subject would eventually become a potential area of the 'diffusion analysis' and 'action' research in the future context, and that study would primarily aim at observing the impacts of the diffusion of different ICT means and services on the social, political and economic change and the respective reform processes across the world.

In short, the increased use of ICT services could not yet bring any major change in terms of social betterment (an improved quality of life) or economic empowerment (an increased earning and economic prosperity) for the Pakistani society. However, there are observed both the positive and negative impacts of the extensive use of ICT services on the strength of social bonding and patterns of social interactions, especially when compared with the pre-ICT era. The use of ICT couldn't bring yet any significant or drastic change in the bureaucratic procedures and their relative level of performance (work efficiency) either. However, there have been observed some positive changes in the academic sector, but not to a scale to be acknowledged as an 'achievement'. The academia and bureaucracy still predominantly exhibit the old fashioned style of work practices. Some businesses have adopted the efficient use of ICT services for their business growth; however, an overwhelming majority of the local enterprises are still utterly unaware of the real benefits and the effective use of these services for their economic growth and business development. There is an increased political awareness among the masses about their civil rights in result of an enhanced exposure to the information sources. Furthermore, the public experiences an increased 'social cohesion' due to the excessive use of mobile services and an extended exposure to an increasingly open and free electronic media.

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<sup>90</sup> <http://irneasia.net/2011/02/gyanendra-law-affirmed/> (Accessed on Feb 12<sup>th</sup>, 2011)

## Chapter 11

### Conclusions and Recommendations

This final chapter aims at concluding the whole debate, recapping the findings of the initially posed research questions, and making a list of recommendations for the policy, regulatory and supplier domains respectively in order to help them understand the dynamics of the diffusion analysis and to facilitate their efforts regarding the rapid and effective diffusion of telecom services. For the readers' convenience, the four major research questions as they were raised in the beginning of the research are repeated here again in order to effectively recap & summarize the discussions. The major research questions for the current thesis are:

1. Who are the major actors within the policy, regulatory, supplier, supporting and user domains, considered as essentially composing the telecom services' market in Pakistan; and how the interactive patterns of their mutual communications and interrelationships within and across the different domains can be mapped out for an improved understanding of the market dynamics?
2. What impacts the diffusion of telecom services has brought for the Pakistani society, and particularly for the telecom consumers, while looking from different aspects of the life?
3. What are the major attributes that play a critical role in the successful diffusion of telecom services; or the other way round, what are the major bottlenecks that impede the development of telecom sector and the diffusion of telecom services in a complex socio-economic context, like in the case of Pakistan? Why the relative success as experienced in case of the rapid diffusion of mobile services couldn't be replicated in case of the diffusion of fixed telephony and internet services in Pakistan?
4. What policy measures, regulatory practices and supplier strategies can be adopted that might help facilitating the rapid and productive diffusion of telecom services in Pakistan, or in case of other countries sharing similar societal attributes or facing similar challenges?

The next sections would precisely draw the readers' attention to those research findings (or the developed understandings), which would quite comprehensively address the above mentioned four research questions.

#### 11.1 Mapping the Market – Actors & their Interactions across the Domains

The telecom market in Pakistan can be viewed as essentially composed of five different domains namely; the policy, regulatory, supplier, supporting and user domains. These domains have their respective functional boundaries with a range of different actors. These actors are observed to have frequent or occasional interactions with the other actors both within and across their respective domains. These interactions are led either by the institutional (formal) requirements in compliance with the assigned roles and obligations (as mentioned in figure 15, section 4.3); or as a deliberate attempt, particularly on behalf of different leading actors (focal actors) in an attempt to protect and fulfill their respective social, political and economic interests that are associated with the specific patterns of the diffusion and adoption of telecom services within the society. The focal actors such

as the policy maker (telecom ministry), sector-specific regulator, telecom suppliers, and users (opinion leaders) try to control the on-going 'translation process' in order to shape the telecom sector and different technologies the way that seems to be essentially in line with their particular interests and their perceived specific versions of truth. Hence, with the help of effectively employing the different stages of translation (i.e. problematizing, interessement/strategizing, enrolling and mobilizing) the leading actors attempt to align the others' interests with their own interests; so that they could translate themselves indispensable in this process. Consequently, those actors who can better control and coordinate the ongoing translation process (by effectively controlling the 'obligatory passage points') would likely dominate; and hence their promoted definitions are likely to prevail during the innovation development, and its subsequent diffusion and adoption processes.

The list of actors and mediators within the five different domains, who currently or potentially may play a significant role in the rapid and effective diffusion of telecom services, is mentioned in table 5. Since the actors and mediators may interact across their respective domains quite often; hence these domains can be imagined as overlapping to each other, like illustrated in figure 16. For the successful diffusion of telecom services, a clear understanding of these focal actors and mediators in terms of their positions (locations in the map) and their assumed interactive patterns (mutual relationships) is deemed to be quite helpful for understanding the real dynamics of the diffusion analysis in a complex socio-economic context; and thus, formulating the strategy and designing the policy and regulatory frameworks accordingly in order to effectively address the key issues.

The configuration of actors (i.e. the specific actors, their assigned roles and position in the map) and the respective patterns of their expected, observed and the desired interactions may considerably shift and vary within different socio-economic contexts, depending on the prevailing nature of the balance of power in each society. Due to largely the authoritarian culture in Pakistan, the role of the telecom ministry (policy domain) and regulator (regulatory domain) has been seen overwhelmingly dominating over the supplier and user domains, while the role of the supporting domain has been seen either ineffective or often more retarding than supporting in the diffusion of telecom services. Hence, the above scenario significantly deviates from the contextual elements and the prevailing institutional conditions that are commonly observed in the highly democratic, welfare and egalitarian societies. Thus, the Pakistani telecom market is considered to be essentially a 'policy and regulatory-driven' market rather than a 'supplier and user-driven' market. However, a gradual shift may be expected in future in result of an increased market awareness and the on-going market reform processes, which would eventually lead the telecom market to pass through the 'two stage transition process'. In the first stage, the market power would gradually shift from the policy and regulatory domain towards the supplier domain in result of an increased market liberalization and de-regulation. Whereas in the second stage, the power of shaping the telecom markets and technologies would further shift from the supplier domain (technology-push approach) towards the user domain (market-pull approach) with an increased acknowledgment for the 'user-centered' and 'user-driven' innovation processes. Nevertheless, this is assumed to be a gradual process, which would take place on its own pace; as the society and the telecom markets would gradually get

liberalized, and accordingly the users would also get more empowered and fully aware of their consumer rights. Such a shift is already quite obvious in case of the cellular market, which has been observed quite developed and matured over the past few years ever since the market got liberalized under the competitive market conditions, as compared to the broadband and fixed line markets.

## **11.2 'Impact Analysis' of the Diffusion of Telecom Services in Pakistan**

The chapter 10 presents a detailed analysis of the observed and experienced impacts of the diffusion and adoption of different telecom services in the local context. However, here the major findings of those debates have been concisely summarized; in order to briefly recap the whole discussion.

Due to enjoying an unprecedented growth within the mass market, the mobile service has proved to be among the most influential and impactful ICT service, in the general public's context. The mass adoption of mobile services has not only increased an unparalleled experience of connectivity in terms of enjoying an always-on and omnipresent communication possibility at affordable rates; but it has also opened up new economic opportunities as well. There are both direct and indirect economic activities generated by the diffusion of mobile services. There has been observed an increased political awareness and social cohesion in the society, in result of an increased use of different telecom services and electronic media. However, the impact of the use of internet has been observed only on the specific segments of the society who have the access and usage possibility; but these marginal segments do not represent the mass market. Over the time, it is expected that the relative impact of internet would eventually grow in result of an increased awareness, reduced prices, and the availability of the relevant contents and applications. On the other hand, the relative impact of the fixed line service seems to be further declined in result of its gradual replacement by the mobile service in the coming years.

There have been noticed both the positive and negative impacts of the ICT services; however it has been argued that ICT itself does not possess any harm, but it is the excessive or misuse of ICT services that actually results in undesired consequences. Hence, it then primarily remains at the discretion of the policy maker, sector regulator, telecom supplier and the user of ICT to properly acknowledge and understand the possible consequences and implications (both positive and negative) of the different patterns of ICT usage in different contexts, in order to effectively address the emerging issues accordingly. Apart from some of the exemplary cases, overall the ICT impacts upon the academic and bureaucratic activities have been found quite marginal in terms of an improved learning and work efficiency respectively. The negative social consequences of the current pattern of ICT usage, particularly in case of the youngsters (who compose around 60% of the mass market) has been also considered quite alarming from different perspectives. Hence, it is important to realize the fact that the successful diffusion of telecom services should not be just measured in terms of an increased teledensity and frequency of usage; but in parallel, the successful diffusion of ICT services should also be benchmarked with the productive use and an effective adoption of these services in different contexts, in order to benefit the society as a whole. Hence, creating a proper balance between the social and economic objectives, and between the supply &



demand-side economies of scale is expected to benefit the entire society; and thus creating a win-win situation for all the stakeholders of the telecom market.

The existing ‘digital divide’ between those who currently have the ‘access’ and the possibility to effectively adopt ICT services and those who haven’t; seems to be growing day by day. This widening digital divide would further deepen the disparity and inequality among the different segments of the society in terms of their comparative learning and educational capabilities, relative capacity for the new skills and competence building, different economic reach and growth opportunities, varying degree of social influence & translational dominance, and with respect to their political empowerment. Hence, the real challenge yet remains to bridge this widening digital divide with an increased policy and regulatory focus on this issue, both from the provision of an affordable access to the masses, but also from the perspective of the effective adoption of the delivered services; with the support of the supplier and supporting domains. This cannot be done until committed efforts have been employed on behalf of all the major stakeholders under the umbrella of a large scale initiative led by a visionary and dynamic campaigner. Such an initiative is required to be led with a genuine spirit in a democratic and participatory mode, through creating increased possibilities for engaging all the relevant actors in order to make them agree on a common vision and a broader agenda through building consensus between the stakeholders upon key issues.

### **11.3 The Major Attributes for the Successful Diffusion of Telecom Services in a Complex Socio-Economic Context – The Case of Pakistan**

Throughout the thesis, the data has been organized in different categories and sub-categories using the ‘open’ and ‘axial’ coding schemes in the initial and intermediate stages of the data analysis respectively. In this final stage, the ‘selective’ coding has been used to develop the ‘core categories’. The following list of attributes cover both the ‘intrinsic’ (i.e. the inherent and built-in features of the services, regardless of the context of application) and the ‘extrinsic’ attributes (i.e. the external factors and elements specific to the context of application). Even though this analysis is largely based on a specific case study; however, the highlighted attributes, generated inferences, and the recommended framework developed through this case study may effectively be used as a source of inspiration or as a comparative benchmark for conducting similar sort of diffusion analysis in another contexts. The following table explicitly highlights the identified core categories for each major domain i.e. the policy, regulatory and supplier domains respectively. The list of sub-topics as covered by each category has been briefly mentioned in front of the respective categories. However, the next section would further reflect on these core categories by making (inductive) generalizations and recommendations based on the research findings. These essential elements of the diffusion analysis are in fact quite intertwined with each other; and therefore, ignoring any single attribute might have significant effects over the collective strength of the whole analysis. Nevertheless, the relative importance of these attributes may significantly vary in terms of their subsequent impacts upon the rapid and smooth diffusion of different telecom services. It is important to mention here that the relative importance of these attributes should not be just viewed here in terms of their impacts over the ‘rate of diffusion’, but should also be seen with respect to the ‘effective and productive adoption’ of the ICT services, within the specific context of the case study.



<b>Policy Domain</b>	
Core Categories	The major discussed issues relevant to the ‘Policy Domain’
The need for a competent, committed, transparent and proactive ministry to effectively patronize and facilitate the development of telecom industry	<ul style="list-style-type: none"> <li>-The proactive and facilitating role of policy domain in the transition towards e-Society and resolving the conflicting issues within its mandate</li> <li>-Creating ‘demand-side economies of scale’</li> <li>-Monitoring the effective implementation of the given policy guidelines</li> <li>-Regular policy reviews to make the required adjustments in response</li> <li>-Structural holes and conceptual ambiguities within policy framework</li> <li>-Running computer-literacy and technology-awareness campaigns</li> <li>-Addressing the issue of very low literacy rate and the poor education through effective coordination with the ministry of education</li> </ul>
Encouraging an increased participation from all the important stakeholders in the policy making in order to build consensus upon the key issues and to enhance the scale of ‘social capital’	<ul style="list-style-type: none"> <li>-Organizing a large scale collaborative initiative for setting a roadmap &amp; a common vision through effectively engaging with all the interested parties and relevant actors from the different discussed domains</li> <li>-Establishing discussion forums and staging different consensus-building platforms and occasions with full facilitation and institutional support</li> <li>-Aim at converging and aligning the diverse range of individual interests on a common agendas in order to develop mutual trust and social capital among the different market players, stakeholders and participants</li> </ul>
Bridging the ‘digital divide’ through effectively achieving the ‘USO’ objectives	<ul style="list-style-type: none"> <li>-Understanding the issue of digital divide &amp; Universal Service Obligations (USO) within the local context</li> <li>-Debating the respective roles and committed efforts of different stakeholders in bridging the digital divide</li> <li>-Creating value at the Bottom of the Pyramid (BoP) – Taking inspiration from the Grameen Bank’s model in Bangladesh</li> <li>-The role of the USF (Universal Service Fund) Company</li> <li>-The impact of the ‘Rabta Ghar’ initiative by PTA</li> <li>- The Connectivity issue (‘Universal Service’ vs. ‘Universal Access’)</li> </ul>
Adopting pro-investment policies - Provision of increased facilitations to encourage and stimulate the investments & indigenous developments in the sector	<ul style="list-style-type: none"> <li>-Increased competition and unprecedented FDI due to sector liberalization</li> <li>-Balancing the scale of FDI with the local investments</li> <li>-The productive role of FDI for the national economy</li> <li>-Pro-investment policies &amp; addressing the security (law &amp; order) issues</li> <li>-Increased facilitations for the investors and telecom suppliers</li> <li>-Looking for the possibilities of indigenous developments in the sector</li> </ul>
Addressing the social and moral issues related with the use of ICT services	<ul style="list-style-type: none"> <li>-Fully understanding and effectively addressing the social and moral issues</li> <li>-Realizing the social and cultural barriers specific to each case</li> <li>-Mass campaigning with the help of ‘opinion leaders’ of the society</li> </ul>
Reducing the excessive amount of taxes imposed on the telecom sector	<ul style="list-style-type: none"> <li>-Excessive taxes on the usage and provision of telecom services</li> <li>-Reducing taxes substantially to benefit both the users and market</li> <li>-Help addressing the issues of affordability &amp; the declining margins</li> </ul>
Protecting the user privacy, freedom of speech, and the consumer rights	<ul style="list-style-type: none"> <li>-Adopting a balanced and moderate policy for data monitoring</li> <li>-Protecting the user’s ‘privacy’ &amp; ‘consumer rights’</li> <li>-Addressing the reasons for the social barriers and restrictions on ICT use</li> <li>-Curtailling the spam, unsolicited and obnoxious emails, messages &amp; calls</li> <li>-Ensuring ‘freedom of speech and expression’</li> </ul>

Addressing the security issues and improving the law & order situation	-Negative Impacts of worsening law & order situation on OPEX and FDI -Higher risks involved in using ICT gadgets publicly in some parts of the country due to the potential threat of theft or snatching at the gun-point
Rationalizing the spectrum management and licensing policy	-Resolving the issue of the unauthorized use of spectrum by public entities -Setting clear timeframe for the licensing of new services - avoiding delays -Rationalizing the licensing procedure - ‘Beauty Contest’ vs. ‘Auctioning’
Rationalizing the telecom reform process for the optimal implications	-Assessing the impacts of the telecom reform processes at regular intervals -Evaluating the conflicting perspectives of all stakeholders on the resulting impacts of telecom reform processes, and taking corrective measures
Dealing with the excessive load-shedding issue	-Excessive ‘Load-shedding’ hours due to the power crisis in the country -Communication and data losses in result of these frequent interruptions -Rising OPEX for the operators, and in result further deteriorated QoS
Addressing the health issues related to the use of ICT	-Presumed health hazards e.g. the fear of brain tumor, eyesight issues and hearing impairment, distracted mind and lack of focus, physical inactivity and laziness, muscular pains and headache, increased frustration - Taking effective policy measures with enforced regulatory protection
Rationalizing the broadband benchmarking	-Debating the rationale of existing broadband benchmark used in Pakistan -The need for re-defining the broadband benchmark
Addressing the elements of distrust and lack of transparency	-Lack of financial transparency and unfair intrusions for the personal gains -Lack of trust among the users on the credibility of government (ministry) -Lack of trust among market players due to the involved vested interests
Facilitating the provision of innovative services and modernization of the telecom infrastructure	-Encouraging the telecom suppliers to regularly up-grade and modernize their networks in order to deliver state-of-the art innovative services -Providing institutional support and facilitating the suppliers to improve -Removing all the bureaucratic hurdles and procedural impediments
Facilitating the targeted segments of society on the privileged basis	-Provision of ICT facilities to targetted user communities on privileged basis such as students, public sector employees & rural-based businesses (small entrepreneurs) in order to stimulate the effective use of ICT services
<b>Regulatory Domain</b>	
Core Categories	The major discussed issues relevant to the ‘Regulatory Domain’
The need for an independent, transparent, unbiased and supportive role of telecom regulator	-The different roles of regulator as ‘controller’, ‘observer’ and ‘facilitator’ -The different perspectives and agendas for a supportive regulator -The participatory role of regulator in achieving the set objectives -The need for an independent, unbiased and transparent regulator -Regulatory interventions on day-to-day operations - The ‘big boss’? -The appreciated & acknowledged roles of PTA in Pakistan -Bringing balance between the social & economic objectives of regulation - PTA’s role as IT regulator in addition to being a telecom regulator
Establishing competition through controlling monopoly and anti-competitive practices	-Why to establish competition & curtail the monopolistic & anti-competitive practices? The overlapping role of Competition Commission -Making competition analysis using different tools e.g. ‘HHI Index’ -Competitive issues in market consolidation – ‘Mergers & Acquisitions’ -Arguments against market dominance and in favor of competition -Accounting and structural separation – The AT&T divestiture model? -Cut-throat price competition, declining ARPU and marginal profits

Resolving the Interconnection & APC related Issues	<ul style="list-style-type: none"> <li>- Interconnection agreements and ‘Access Promotion Contribution’ (APC)</li> <li>- Controversies over the current interconnection and APC regimes</li> <li>- Requiring regulatory review to adjust the rates and revise formula</li> </ul>
Adopting the real spirit of ‘technology-neutral’ regulations	<ul style="list-style-type: none"> <li>-The spirit of ‘technology-neutral’ licensing and regulatory regime</li> <li>-Debating the regulatory restrictions on WLL mobility and VoIP</li> <li>-Adapt with the regulatory requirements of the emerging telecom markets</li> <li>-VoIP vs. ‘Grey trafficking’ - The future of IP telephony</li> </ul>
Dealing with the issue of excessive licensing and ‘inefficient entries’	<ul style="list-style-type: none"> <li>-Realizing the relation b/w excessive licensing &amp; inefficient entries</li> <li>-The potential entry of MVNOs into cellular business &amp; the impacts</li> <li>-Rationalizing the licensing approach to deal with the issue</li> </ul>
Facilitating the ‘Rights of Way’ (RoW) and ‘Infrastructure Sharing’	<ul style="list-style-type: none"> <li>-Addressing the concerns over the Rights of Way (RoW) and ‘Infrastructure Sharing’ – The significance and bottlenecks</li> <li>-Realizing the benefits of adopting the OAN or ONP models</li> </ul>
Neutralizing the incumbent’s control over the ‘Essential Facilities’	<ul style="list-style-type: none"> <li>-The competitive significance of controlling the ‘essential facilities’</li> <li>-Addressing the involved controversies and conflicting issues</li> <li>-Neutralizing the dominance by engaging a third party as custodian</li> </ul>
Rationalizing and effectively enforcing the price & QoS regulations under one umbrella	<ul style="list-style-type: none"> <li>-Implementing effective ‘Price-Cap’ regulations for both the ‘ceiling and floor prices’ – Ensuring both the user’s affordability and supplier’s margin</li> <li>-Dealing with the issue of hidden charges &amp; ensuring billing transparency</li> <li>-Quality of Service regulation – ‘a fall in QoS is a hidden price increase’</li> <li>-Regulating QoS &amp; price by a single team - Increasing the coordination</li> </ul>
Rationalizing the benchmarks used for mapping the teledensity	<ul style="list-style-type: none"> <li>-Mapping teledensity – Actual number of users vs. registered SIMs</li> <li>-Revising the benchmarks &amp; parameters used for mapping teledensity</li> <li>-Looking at the case from the vantage point of ‘impact analysis’</li> </ul>
Assuming an effective and well-coordinated role of CCP	<ul style="list-style-type: none"> <li>-The well-coordinated role of Competition Commission of Pakistan (CCP)</li> <li>-The possible ‘role-overlapping’ with PTA – Possible issues &amp; concerns</li> </ul>
Addressing the ‘Numbering’ issues	<ul style="list-style-type: none"> <li>- Optimal use of ‘Numbering Plans’</li> <li>-‘Number Portability’ – Fixed and mobile number portability</li> <li>-Addressing the potential issues involved in ‘Number Trading’</li> </ul>
Adopting an effective dispute settlement mechanism	<ul style="list-style-type: none"> <li>-Adopted procedures for resolving the inter-institutional ‘role-conflicts’</li> <li>-Explicitly documenting the ‘dispute settlement’ mechanism</li> </ul>
Regulating the Restricted use of multiple SIM cards	<ul style="list-style-type: none"> <li>-Addressing the issues involved in the use of multiple SIM cards</li> <li>-Ensuring the effective enforcement of the regulatory restrictions</li> </ul>
Regularly assessing the ‘impact analysis’ using multiple schemes in order to observe the scale of variance between the desired & actual impacts of ICT services	<ul style="list-style-type: none"> <li>-Assessing the impacts of the diffused ICT services on different aspects of the life using different schemes (surveys, interviews) at regular intervals</li> <li>-Utilizing the results of ‘impact analysis’ to gauge the scale of the prevailing ‘digital divide’ for making the required adjustments accordingly</li> <li>-Making assessments in terms of social betterment, economic uplift, political empowerment, learning and awareness and work efficiency</li> </ul>
<b>Supplier Domain</b>	
Core Categories	The major discussed issues relevant to the ‘Supplier Domain’
Improving Quality of Service (QoS) and ‘Responsiveness’	<ul style="list-style-type: none"> <li>-Addressing the Poor QoS (i.e. complaints about the slow data rate, poor voice quality, noise and interference, bad customer service etc.)</li> <li>-Increased responsiveness (e.g. technical faults and in-time reparations)</li> <li>-Reducing the time between the ‘fault detection’ and ‘fault clearance’</li> </ul>

Addressing the issues related to ‘connectivity’, ‘access’, ‘coverage’ and ‘network optimization’	<ul style="list-style-type: none"> <li>-Extending the ‘coverage’ and increasing the serving capacity</li> <li>-Optimal usage of the available network capacity &amp; deployments</li> <li>-Addressing the ‘access’ and ‘connectivity’ related issues</li> <li>-Ensuring an ‘omnipresent’ (ubiquitous) and ‘seamless’ connectivity</li> <li>-Fulfilling the licensing obligations to meet the USO objectives</li> <li>-Gradual migration towards wireless &amp; fiber-based access solutions</li> </ul>
Ensuring the networks’ regular up-gradation and maintenance	<ul style="list-style-type: none"> <li>-Increasing investments in network maintenance and up-gradation</li> <li>-Modernizing the networks to support new technological services</li> </ul>
Understanding the product’s ‘Relevance’ and the ‘Context of Usage’	<ul style="list-style-type: none"> <li>-Understanding the ‘context of usage’ and the service ‘relevance’</li> <li>-Relevant contents and applications for each targeted user group</li> </ul>
Increasing ‘Personalization’ by offering ‘user-oriented’ packages with an increased ‘scalability’ and ‘flexibility’	<ul style="list-style-type: none"> <li>-Increasing ‘personalization’ through an increased scalability and the user’s control over the product’s design and usage</li> <li>-‘user-orientation’ in both the product’s development &amp; diffusion parts</li> <li>-Introducing ‘unbundling of services’ to help avoid paying unnecessarily for the unused/undesired services - Offering flexible &amp; scalable packages</li> </ul>
Ensuring the billing transparency and avoid ‘deceptive marketing’	<ul style="list-style-type: none"> <li>-Avoid wrong billing and lack of transparency - The ‘hidden charges’</li> <li>-Increasing user-control over the billing in order to check its authenticity</li> <li>-Reducing the multiplicity of ambiguous/tricky packages with less clarity</li> <li>-Avoid the ‘deceptive marketing’ practice in the media campaigns</li> </ul>
Competing on the basis of ‘Value-added’ (VAS) & innovative services for an increased ARPU and reduced ‘Churn Rate’	<ul style="list-style-type: none"> <li>-Setting VAS and innovative services as the new competitive base for an increased ARPU</li> <li>-Provision of innovative services to differentiate in competition</li> <li>-Increasing customer’s ‘loyalty’ to reduce the ‘churn rate’</li> <li>-‘Prepaid vs. Postpaid’ regimes – Strategizing for changing the trend</li> </ul>
Facilitating the users in overcoming the technological ‘Complexity’ and ‘Usability’ issues	<ul style="list-style-type: none"> <li>-‘Complexity’ (technological barrier) vs. ‘Simplicity’ (user-friendliness)</li> <li>-General literacy vs. ICT literacy - Requiring a strategic shift in focus</li> <li>-Improving service ‘usability’ among the masses</li> <li>-Reducing the product’s complexity and making it user-friendly</li> </ul>
Addressing the ‘price affordability’ issue through analyzing the ‘price elasticity’ of each targeted user-community	<ul style="list-style-type: none"> <li>-Reducing the excessive prices of broadband and the line rent of fixed line</li> <li>-Affordable price is key to rapid diffusion of telecom services, particularly among the targeted communities with restricted purchasing power</li> <li>-Detailed analysis to check ‘price elasticity’ factor for each targeted group</li> <li>-Affordable packages for the low-income segments of society e.g. students</li> </ul>
Controlling the administrative and financial mismanagement issues	<ul style="list-style-type: none"> <li>- Eliminating the element of corruption and ensuring transparency</li> <li>-Minimizing the bureaucratic procedures and unnecessary formalities in order to avoid procedural delays and to increase the work efficiency</li> </ul>
Ensuring data and transactional security in the e-banking & e-commerce applications	<ul style="list-style-type: none"> <li>-Ensuring data and transactional security for enhancing the consumer’s trust over e-banking, mobile-banking, and e-commerce applications</li> <li>-Giving additional incentives for using bank cards &amp; above applications</li> <li>-Compensating the customer’s losses if caused due to data security issues</li> </ul>
Becoming part of the local & global ‘Innovation Networks’	<ul style="list-style-type: none"> <li>-Understanding the dynamics and complexities of getting engaged with the strategic alliances &amp; joint ventures or out-sourcing and sub-contracting</li> <li>-Learning and Adapting while being part of these innovation networks</li> </ul>

Improving the product's 'intrinsic' attributes	-Assessing the 'intrinsic' attributes of the desired services (to be diffused) with other competing services -Comparing the intrinsic attributes like: 'portability', 'mobility', 'interactivity', 'robustness', 'aesthetics', 'ergonomics' - Apart from those discussed above including: 'complexity', 'usability', 'affordability', 'relevance', 'scalability', 'safety' (health), 'security' (data/transactional)
Managing customer relations and caring about the consumer rights	-Understanding the new challenges faced in successfully managing and strengthening relations with the customers – improving the CRM system -Developing better understanding about the consumer rights – improving the underlying assumptions of corporate social responsibilities (CSR)
Creating 'demand-side economies of scale' through content development & market awareness	-Development of useful and relevant contents and applications -Developing contents in local languages to address the 'language barrier' - Running marketing campaigns to aware the masses about the benefits and relevance of the targeted ICT services within their local context
Increasing the bandwidth capacity and consolidating the international connectivity	-Investing to increase the bandwidth capacity for handling the expected surge in the volume of broadband and voice traffic -Provision of satellite & terrestrial backup in case of facing any failure in the undersea fiber cables that currently provide international connectivity
Reorienting the adopted business values and market practices	-Understanding the problems in the prevailing business values & practices -Reorienting the business values and practices to better flourish within the competitive landscape -A recommended list of business values & practices

Table 13: The Core Categories and the Major Diffusion Attributes of ICT Services in Pakistan

Source: Author

#### 11.4 The Inductive Generalizations and Recommendations

This section summarizes and concludes the whole debate by presenting a list of 47 major attributes that comprehensively explain the dynamics and the complexities involved in the diffusion of telecom services, in the specific context of Pakistan. This concise recap of the thesis' debates essentially provides a comprehensive account on the major reasons for the successful diffusion of telecommunications services, and also the major bottlenecks that retard the rapid and smooth diffusion of telecom services in the local context. The generalizations and recommendations made here may potentially serve as a guiding framework for the policy, regulatory and strategic debates aiming at conducting the diffusion analysis within a complex socio-economic context. However, it is important to mention here that all the recommendations put forwarded during the detailed analysis in the previous chapters have been not recapped in this concluding chapter for the obvious reason of keeping brevity and conciseness, as required at this stage of the analysis. Hence, for having a detailed account of those discussions, the readers are advised to follow the individual chapters. Here the recommendations have been made immediately after presenting the research 'findings' in case of each individual diffusion attribute. This pattern has been deliberately adopted in order to continue the flow of the text, and to also avoid unnecessarily repeating the same arguments again.

This section draws generalizations from the above defined major attributes of the diffusion analysis, essentially based on the emerged data of the studied case. It has been realized that in most of the

cases within these listed attributes, the cellular mobile service seems to have relatively more favorable conditions as compared to the fixed line and internet services in terms of the rapid diffusion and effective adoption of these services. That clearly explains the underlying reasons for the rapid diffusion and smooth adoption of mobile services in the society when compared with the relatively quite unsuccessful experience in the case of the diffusion of fixed line and internet services so far. Despite the fact that the nature of these generalizations are primarily case-specific; nevertheless these generalizations may have an extended appeal for those countries as well which essentially face similar sort of challenges in the diffusion of ICT services, and they also share to some extent the major tenets of the socio-economic context of the discussed case. These drawn ‘Generalizations’ (i.e. G.1 to G.47) have been presented here in form of ‘recommendations’; so that it could be used as a guiding framework for defining the policy, regulatory and strategic roadmaps.

#### **11.4.1 Policy Domain**

##### ***G.1: The need for a competent, committed, transparent and proactive ministry to effectively patronize and facilitate the development of telecom industry***

The role played by the telecom ministry so far has been called relatively weak and unsatisfactory, particularly in case of fixed line and internet services as compared to its relatively proactive role in case of the diffusion of mobile services. The proactive role of MoIT has been considered critical in creating demand and appetite for the use of ICT services; by initially making available online all the public sector data, and accordingly their different applications and services that are considered relevant to the general public. The ministry’s proactive role has also been seen critical in encouraging and facilitating the micro-financing schemes to be launched by banks and other financial institutions for increasing the user’s affordability in purchasing ICT devices and using telecom services. In addition to that, government is expected to run ‘computer-literacy’ and ‘technology-awareness’ programs preferably in the academic and public sector institutions, rural-based small businesses and at the communal level, especially among the rural communities in collaboration with other stakeholders. MoIT has been asked to regularly conduct ‘policy reviews’ in order to ensure the effective implementation of the delivered policies in their genuine spirit, without letting any ‘distortion of meanings’ to occur during their interpretations and translations by different actors. The ‘structural holes’ and conceptual ambiguities should also be removed in the decision making process and during the ‘delegation of responsibilities’ in the given policy framework. The ministry has to also enhance its image among the telecom users and other stakeholders as trusted and transparent policy maker. The consumers’ trust on the policy and regulatory domain was found relatively high in case of mobile services when compared with other telecom services. Finally, to address the very low general literacy rate and poor quality of education; the IT & telecom ministry should work in coordination with the ministry of education in order to design a strategic plan where ICT could be effectively used for promoting education; and simultaneously the increased literacy rate could in result be used to reinforce the extended & productive use of ICT.

##### ***G.2: Encouraging an increased participation from all the important stakeholders in policy making to build consensus upon key issues and to enhance the scale of ‘social capital’***

A proactive role of MoIT has been considered highly desirable in stimulating and organizing a large scale collaborative initiative by engaging all the relevant and interested stakeholders of telecom

industry in order to set up a roadmap and common vision for making a gradual and smooth transition towards becoming an information-led 'e-society'. This could be done through initially establishing discussion forums at different levels; hence, staging different consensus-building platforms and occasions with full facilitation and institutional support at the ministerial level for such consultative activities. These efforts should be aimed at converging and aligning the diverse range of individual interests on the larger scale at some common agendas in order to develop a mutual trust and an increased 'social capital' among the market players and industrial participants.

### ***G.3: Bridging 'digital divide' through effectively achieving the 'USO' objectives***

The mobile service has now literally become a sole benchmark for referring to the country's access and connectivity status due to its disproportionately high representation in the total teledensity. Hence, the recent growth in mobile services is frequently quoted by the policy and regulatory domain as a success story in their efforts to bridging the digital divide and meeting the USO objectives. The fixed line and internet access, on the other hand, have an extremely low share in the total teledensity statistics. The lack of a common vision among the telecom stakeholders, the missing strategic alignment between the differing interest groups, a poor 'political will', and the weak 'social capital' seem to be among the major hurdles in replicating the successful experience of Bangladesh (refer to Grameen Bank's case) in productively connecting the rural communities with ICT services; hence creating a real value at the 'bottom of the pyramid'. The role of USF Company has been generally appreciated; however, the respondents also consider the fact that the provided statistics couldn't be turned into 'visible impacts' in terms of achieving social betterment, economic uplift and political empowerment of the relatively deprived segments of society through ICT connectivity. In this context, PTA's Telecenters ('Rabta Ghar') initiative has been also not considered having any noticeable impact on bridging the digital divide through rural connectivity, not even in terms of statistics either to any convincing numbers. For Pakistan, the model of 'universal access' for a shared-mode community level connectivity seems a more viable option to be set as a benchmark in order to meet the USO objectives, knowing the current economic constraints of the country. The mobile network has been considered the only access technology which has the country-wide footprints both in terms of coverage and its serving capacity; hence, it's more likely continued to be used as a basic benchmark for the access provision across the country.

### ***G.4: Adopting pro-investment policies and the provision of increased facilitations to encourage & stimulate the investments and indigenous developments in telecom sector***

The unprecedented growth in FDI in the telecom sector, ever since the sector liberalization and deregulation processes took effect during the years 2003-05; essentially resulted in an extensive country-wide network rollout and infrastructure development activities, particularly in the mobile sector as it was considered one of the major reason for the rapid growth of mobile services. On the other hand, there has been relatively negligible investments in the fixed line sector, apart from some investments that were committed in the roll out of WLL and dark fiber networks for the provision of fixed-wireless access and backhaul transmission respectively. However, there has been disappointingly low investments committed in the deployment, up-gradation and the maintenance of copper networks that eventually resulted in the declined QoS due to the deteriorated conditions of the deployed copper (landline) networks; resulting in a significant reduction within the number of



fixed line subscribers in response. However, despite the reasonably large scale of investments committed in the deployment of WiMAX, EVO and optical fiber networks, the broadband services didn't experience the kind of growth as it was observed in case of the mobile services. The need has been felt to encourage investments in the fixed line and broadband services by giving additional facilitations to the investors and improving the general law & order situation in the country. There is also a need to bring a proportional balance between the scale of local and foreign investments in the telecom sector by encouraging an increased participation from the local investors through adopting pro-investment policies and offering them privileged incentives. In a country where the individual and group level interests often rule over the national and communal interests; the role of a visionary, trusted, transparent and committed political leadership is highly desired to encourage the indigenous technological developments with the help of an increased participation from both the local and foreign investors.

#### ***G.5: Addressing the social and moral issues related with the use of ICT services***

The social and moral issues associated with the use of ICT services do play a critical role in the diffusion of these services. These issues significantly resist and slow down the adoption of ICT services if the services are perceived as incompatible with the existing social norms and the prevailing cultural values of the society. The social problems include mainly the issue of an increasing social detachment; in result a gradually decreasing level of emotional attachment and social bonding with the people living in the users' closed proximity, due to an increased scale of human-machine interactions, which often makes the users obsessed with those devices and services. The moral concerns include the availability of ethically unacceptable contents, particularly on internet due to the risk of undesired immature access by children and teenagers. This further includes the excessive use of ICT services in a pattern that is incompatible with the existing social norms, and which essentially threatens the prevailing cultural values. These concerns are found highest in case of the use of internet services, followed by mobile and then the fixed line services. In this respect, the policy makers are requested to be vigilant about the availability of such contents, and also the usage patterns and resulting undesired impacts of these services upon different groups of users particularly the children, students and youngsters. Hence, it is recommended that the basic rationale and the resulted impacts of the multiple subscription/service packages, as currently offered by different operators to stimulate the ICT usage among those targeted groups of users should have been properly judged against the parental concerns over the excessive and misuse of those services. In this regard, the ministry should hold successive discussions with randomly selected samples of parents in order to properly understand their concerns; and thus to effectively address their concerns in the policy-making. Considering the fact that Pakistan is essentially a communal or family-based society led by the family heads; it is imperative to get the support of the parents as 'opinion leaders' in the effective adoption of ICT services at the community and household levels, when running mass campaigns for creating awareness about the productive use of ICT services.

#### ***G.6: Reducing the excessive amount of taxes imposed on the telecom sector***

The excessive amount of governmental taxes on the provision and use of telecom services have been unanimously condemned by both the supplier and user domains; while considering those excessive taxes a major barrier in the growth of telecom sector. The suppliers are grimed for their

declining profit margins; whereas the users are also upset for an increasing amount of taxes (GST) paid to the government for consuming these services. Often the operators also pass on those taxes which were essentially supposed to be paid by the suppliers, to the consumers; hence, the consumers eventually become the victims for paying the tax amount in terms of increased service charges. The amount of taxes currently imposed upon the telecom sector in Pakistan has been called among the highest in the regional countries. Therefore the government has been asked to reduce the amount of taxes on telecom sector in order to help promoting the affordable use of ICT services.

#### ***G.7: Protecting the users' privacy, freedom of speech, and the consumers' rights***

The telecom users are concerned about the violation of their privacy by the communication intruders or 'eavesdroppers' through monitoring their incoming and outgoing voice and data traffic. They feel uncomfortable while communicating freely as suspecting that their voices and data may have been recorded or monitored by some government agencies for the security or political reasons. They also consider it against the basic civil and consumer rights that ensure the 'freedom of speech and expression' in a democratic country. Hence, in the users' common perception, the data and voice monitoring has negative impacts on the use of telecom services; and it severely hampers the fearless communication and sharing of opinion among the telecom users. Thus, the government needs to adopt a balanced and moderate policy about the data monitoring issue; and it should use restrictedly its mandate for data monitoring only for the security reasons, but this mandate should not be used to suppress the political opinions. Another aspect of the privacy violation is the reception of spam, unsolicited and obnoxious emails, messages and calls from unwelcome and unknown sources. The effective implementation of PTA's regulation over the 'protection from spam, unsolicited and obnoxious calls' (2008) should be helpful in addressing this aspect of the privacy issue. However, the users' concerns about protecting their privacy and consumer rights were found vulnerable in all three cases of telecom services. In this regard, an effective and comprehensive policy is required to be enforced to fully address the users' concerns over this issue.

#### ***G.8: Addressing the security issues and improving the law & order situation***

The heightened safety and security concerns both among the telecom suppliers and users in the presence of prevailing poor law and order situation has been clearly witnessed in the country. This has resulted in multifold consequences such as: for the telecom suppliers, in terms of an increasing OPEX and difficulties in maintaining their operations; for the investors, in terms of higher risks involved in their investments; and for the users, in terms of having higher concerns about the safe usage of ICT gadgets in the public areas and open spaces due to the fear of their gadgets being snatched even at the gun-point in many parts of the country. Hence, the poor security conditions undoubtedly have multifold negative impacts on the diffusion of telecom services; such as discouraging the investments in the telecom sector, increasing the operators' operational costs and hampering their operational capabilities, and an anxious outside use of telecom services. The government needs to fully understand and effectively address this extrinsic macroeconomic issue of critical importance, which severely affects the diffusion of ICT services in the country.

### ***G.9: Rationalizing the spectrum management and licensing policy***

The government's effort to liberalize the telecom markets by issuing numerous numbers of licenses has brought mixed results. On the one hand, the mobile market has experienced huge growth and also an increased competition; however on the other hand, the fixed line and internet markets didn't experience similar results. There is a need to reconsider the basic rationale of spectrum management and the adopted licensing policy in order to set new parameters for measuring the success in terms of the market growth, the resulting impacts, and the achieved social benefits; instead of only looking at an increased financial benefit out of the lucrative licensing process for the government itself. MoIT and FAB are also required to effectively resolve the issues related to the availability of the assigned and allocated spectrum for the dedicated commercial applications, to ensure the authorized use of spectrum by different public entities. In this context, the government needs to compensate itself for the losses of the public entities for shifting their operations to the new allocated frequencies; instead of asking the operators to do so, since it seems simply unjustified. Such unauthorized use of the spectrum for legally unspecified applications (i.e. not acknowledged by ITU and FAB as per their 'frequency tables') potentially causes for not only the 'signal interference' related issues, but it has been called also a major reason for the current delays in the deployment of new technological services, such as in case of the 3G mobile services.

Even though the 'beauty contest' has been favored by most of the operators to be adopted as the licensing procedure, but they also realize the fact that it's unlikely to happen, considering that Pakistan is primarily or traditionally an 'auction-based' market for licensing. The government has been criticized for irrationally expecting to squeeze as much money out of the licensing process as possible, while considering the telecom market as essentially a 'cash cow'. Due to the government's this short-term profit seeking approach, the suppliers are unanimously agreed to lobby for delaying the 3G licensing until the current financial crisis is over and some market stability has been achieved either through market consolidation or by an increased ARPU. Hence, it is recommended that government should seek for the long-term benefits through facilitating the industrial and market growth, and by adopting a balanced and realistic approach in its licensing policy; probably a mixed version of the two proposed models that utmost suits the local context and market conditions. The government should ensure avoiding any unnecessary delays in the licensing process for the deployment of new services.

### ***G.10: Rationalizing the telecom reform process for the optimal implications***

The telecom reform initiatives as implemented in Pakistan with the help of 'telecom re-organization act' (1996), sector 'deregulation' (2003) and the sector 'liberalization' processes have been generally applauded by all corners; however the case of PTCL 'privatization' has been essentially remained a controversial issue, primarily due to the way it has been handled. Hence, in result of the sector deregulation and liberalization; there have been observed highly positive impacts on the mobile industry both in terms of establishing competition, but also an unprecedented infrastructure development and the resulting market growth. On the other hand, there has been observed a moderate scale of impact upon the broadband and WLL markets. However, statistically there has been no obvious impact or any change observed on the status-quo of the landline, DSL and dialup-based internet markets; neither in terms of any change in the competitive status nor in the market

growth. This is despite the fact that the incumbent of the fixed line and internet services has been privatized for many years now, and also the fact that there have been large numbers of licenses issued to the new entrants; which essentially indicates the presence of a list of other entangled variables as well that severely retard the competition and growth in these markets. It is recommended here that the privatization policy should also be reviewed with given the priority to protect the strategic assets, while keeping in mind the national interests at the first place.

#### ***G.11: Dealing with the excessive 'load-shedding' issue***

The excessive load-shedding (repetitive power failures for long hours) has had severely negative impacts on the usage of computer and internet applications due to the users' inability to continue their work in result of these frequent interruptions. It discourages working with internet due to these recurrent power breakdowns that potentially may occur unexpectedly at any moment, resulting in the communication and data losses. However, the mobile users seem to be relatively less affected with the load-shedding problem, since they somehow manage to charge their mobile handsets; hence their usage pattern has not been that critically disturbed as of the internet users, and the same is true in case of the fixed line users (i.e. the users of the cordless handsets). On the other hand, from the suppliers' perspective the impact of the currently experienced excessive load-shedding is simply disastrous both in terms of maintaining the QoS, but more importantly in terms of the rising OPEX (due to the rising cost of managing the backup power sources) to run their operations uninterruptedly. Hence the government is recommended to immediately address this burning issue if it is interested in proliferating the provision and the effective use of ICT services in the country.

#### ***G.12: Addressing the health issues related to the use of ICT***

The telecom users in Pakistan were not much aware of the possible negative impacts of the extensive use of ICT services on the health; hence they were also not that much concerned about the health related issues (e.g. the common fear about brain tumor, and other possible diseases in result of an extensive exposure to radio waves, as sometimes reported in the media and research articles). The telecom consumers were found to be relatively much less aware of such stories when compared to the users of the modern part of the world. However, the users were clearly found highly concerned about the visible negative health impacts in terms of laziness, eyesight problems, hearing impairment and the observed distracted minds in result of an extensive usage of those devices and services. The current regulations on 'Protective installation of Radio Base Station Antennas for Securing Public Health and Safety' (2007) and the PTA's provided 'Guidelines regarding Environmental and Health Related Effects of the Cellular Base Station Antennas' are primarily focused on the possible impacts of radio wave on public health, environment and safety. However, the author recommends the policy makers and regulator to broaden their agenda and accordingly the scope of their operational mandate in this regard in order to comprehensively address this important issue, while taking into account both the experienced and the projected scenarios.

#### ***G.13: Rationalizing the Broadband Benchmarking***

The current definition adopted for broadband services in Pakistan i.e. 128 kbps as per the 'broadband policy' (2004) has been considered insufficient to be used for the broadband benchmarking purposes, even among the regional countries as well. Such a low data rate has been

called insufficient to support most of the broadband compatible and video-enabled services and applications; hence it has been considered a misleading benchmark, especially when used for the cross-country comparison purposes at an international level policy debates for judging the relative diffusion of broadband services among different countries. Therefore it is recommended that MoIT should review its broadband policy and it should adopt at least 512 kbps as a broadband benchmark, while comparing with 2mbps data rate, which has been commonly considered as the minimum benchmark for assessing the broadband diffusion in the developed countries.

#### ***G.14: Addressing the elements of distrust and lack of transparency***

It has been observed time and again that a great deal of concern among the telecom users and suppliers does exist about the government's financial transparency and credibility. The ministry has been accused for the unfair intrusions at occasions for protecting its own vested interests; and in some cases even for the personal gains, e.g. the notorious case of rising the rates of ASR by ministry that enormously increased 'grey trafficking' in the country over the past few years, hence causing substantially losses to the national economy. The element of distrust among the users was found relatively high in case of the fixed line and internet services as compared to the mobile services. Hence, it is recommended here that the ministry needs to work hard in order to regain its lost credibility and the positive image among the other stakeholders through dedicatedly playing a fair, unbiased, transparent and parental role in the telecom market.

#### ***G.15: Facilitating the provision of innovative services and the modernization of telecom infrastructure***

The telecom industry has observed over the past few years rapid growth in the deployment of modern network facilities, primarily under the competitive pressure in order to deliver state-of-the-art mobile and broadband services to the consumer market. However, despite charging a significantly large amount of APC; the fixed incumbent seems to be relatively unsuccessful in modernizing (or up-grading) and maintaining its country-wide cable deployments, particularly in case of copper networks. That has been called primarily the major reason for the substantially deteriorated QoS in case of the delivered landline services; due to an increased scale of faults occurring at the 'last mile' connections. This situation has actually suffered not only the quality of voice services but the data services as well, since the quality of copper based dialup and DSL services have also suffered from these frequent line faults. Hence, due to the deteriorating conditions of the copper networks, these copper cables are called incapable of sufficiently supporting the broadband applications such as the 'Triple-play' (i.e. the telephony, internet and cable TV services in one package). Therefore, the ministry (MoIT) and the regulator need to check the performance of the fixed line and broadband incumbent, to observe how effectively the incumbent addresses to the concerns over its slower response to upgrading and maintaining its network facilities; in order to sufficiently support the modern innovative services for the public benefit. The ministry also needs to encourage the other telecom suppliers as well to continuously modernize their telecom infrastructure and network facilities by providing them full institutional support and facilitations. That must also include the removal of all the bureaucratic hurdles and procedural impediments that they currently face in the rapid deployment of their network facilities.



#### ***G.16: Facilitating on the privileged basis the targeted segments of society***

The ministry has been also recommended to provide the basic ICT facilities to the targetted groups or user communities on privileged basis in order to stimulate and promote the effective and productive use of ICT services among those specific segments of society. At an initial stage, it is recommended to primarily focus on the students (essentially the college and university level students), the public-sector employees and the rural-based small businesses and individual entrepreneurs. These recommended segments of society have the highest need but relatively low purchasing capacity; hence, by subsidizing ICT services to these specific user communities would effectively address the ‘price elasticity’ element in the equation of the adoption of telecom services.

#### **11.4.2 Regulatory Domain**

#### ***G.17: The need for an independent, transparent, unbiased & supportive role of regulator***

The role of the telecom regulator in Pakistan has been traditionally viewed somewhat like a ‘controller’ and less like an empathetic ‘facilitator’ in the provision of telecom services. This may be partially a reflection of the overwhelmingly authoritative culture, which is largely prevailing in the society. However, it is recommended that the regulator should compassionately engage with the telecom suppliers in participatory mode in order to properly understand their genuine concerns by being part of the phenomenon rather than controlling them at a distance. The regulator needs to remove its image as being ‘big brother’ who is keen to continuously watch and intervene even in day-to-day operational issues. Hence, the regulator should rather focus on the end-results and resulting impacts to assess the performance of telecom suppliers in a more pragmatic way. The authoritarian and dogmatic style of regulation is not appreciated in the democratic societies. Instead, a friendly and participatory role is expected from the regulator by bringing all the telecom stakeholders on board and engaging with them in a continuous dialog within an established and properly acknowledged ‘discussion forum’ in order to genuinely achieve the policy objectives in their real spirit. The literature review on the regulatory practices suggests that there is a need for bringing a certain degree of balance between the social and economic objectives set to be achieved by telecom regulations, which means that achieving one objective should not be at the cost of losing other objective. Hence, the objectives set for achieving the social and consumer welfare through an increased, affordable and productive use of ICT services, even in the case of ‘bottom of the pyramid’ as well, should ideally go hand-in-hand with the economic objectives of the provision of those services in terms of substantial growth within the industrial revenues and reasonable returns on investments.

The proactive role of PTA as observed in case of the diffusion of mobile services has been noticed rather absent in case of the broadband and fixed line services. The regulator has been commonly blamed for unjustifiably biased and tilted towards protecting the fixed and broadband incumbent’s strategic interests (due to the government’s involved stakes in it); and it is also because of the regulator’s itself being a public entity. However, the internationally recognized best regulatory practices suggest that the regulator must be an independent, unbiased and transparent entity. But presumably this could only happen if the regulator gets the financial independence through generating its own resources from the industry itself for running its all operations, with no or least

governmental grants involved; hence to make the regulator enable to not accept any political influence either from the government or by any other influential group. Furthermore, since in Pakistan the telecom regulator has been also held responsible for regulating the IT sector; hence, a special taskforce or a dedicated team is required to be effectively trained, which should be made capable of understanding the idiosyncratic features of IT sector in order to properly address the key issues and concerns of IT sector in the wake of an ongoing convergence between the previously separated IT/computing, media/broadcasting and telecom markets.

#### ***G.18: Establishing competition through controlling monopoly and anti-competitive practices***

The regulatory domain's primary task has been expected to ensure a free and fair competition in the presence of a level-playing field through curtailing the monopolistic and anti-competitive practices. The HHI index based market competition analysis reveals a very high concentration and market dominance in the fixed line (landline) market, a moderate competition in WLL and broadband markets; however, it indicates the presence of a highly competitive oligopolistic mobile market. There are signs of market consolidations (mergers and acquisitions) both in the broadband and mobile markets due to the increasing expenses and diminishing returns on investments. An effective and result-producing enforcement of both 'accounting and structural separations' should be kept on the table for consideration, as per the scale of treatment is required; in order to effectively eradicate the anti-competitive practices committed by the market players, particularly in case of the dominant players who hold the 'significant market power' (SMP) at multiple layers of the value chain (e.g. the wholesale and retail markets), as it is also in line with the documented spirit of the 'De-Regulation Policy' (2003) and the 'Accounting Separation Regulation' (2007).

#### ***G.19: Resolving the Interconnection & APC related Issues***

The interconnection regime seems to be transparently working with the help of established interconnection agreements signed under the provision of interconnection guidelines called 'Reference Interconnect Offer' (RIO) with no major bottlenecks in the traffic distribution inside the country; however, access to some co-locations and particularly the issue of the 'Access Promotion Contribution' (APC) seems to be the main bone of contention among the competing suppliers. The APC rules (2004) and Access Promotion Regulation (2005) seem to be incapable of addressing the competing suppliers' mounting concerns over this issue. The competing suppliers consider the current APC charges as too high that eventually cause for the increased 'approved settlement rates' (ASR) as well; and in result a declining traffic volume of international incoming calls with an increased trend of 'grey trafficking' that cost huge losses to the national economy. It is demanded by the competing suppliers that the current APC should be either reduced significantly or otherwise shared among the competing suppliers (including the broadband and mobile operators) on the 'performance bases' with respect to their achievements of the targets set for the access promotion, while deploying any telecom access technology. The above demand is based on the fact that despite the currently increased scale of APC received by the fixed incumbent for the landline access promotion; however, the statistics and annual reports suggest otherwise, reflecting that there is a continuous and substantial decline in the committed investments from the fixed incumbent on the access promotion and even in maintaining the existing copper lines. This performance gap has



resulted in a further decline in the delivered QoS; hence a further decrease in the landline teledensity instead of expecting any increase in result of the received APC. This whole scenario suggests that the APC has essentially lost its real intention for which it was actually aimed for. Hence, it has been recommended to revise the APC formula in order to rationally adjust the rates and its subsequent distribution among the market players following the improved underlying rationale behind this model; in order to align the desired objectives with the resulting achievements.

#### ***G.20: Adopting the real spirit of ‘technology-neutral’ regulations***

The licensing and regulatory regimes are essentially supposed to be ‘technology-neutral’ as per the De-Regulation policy (2003), but in essence there are several implicit regulatory barriers on the emerging technologies; such as the restrictions on the full-fledged implementation of IP telephony (VoIP) and an extended voice mobility (including the handsets availability) for the CDMA based WLL services. While experiencing the ongoing phenomenon of ‘digital convergence’ in terms of the transmission and channelization of all sorts of digital contents through a unified ‘All-IP’ pipeline called the NGN network; such technology-specific restrictions are assumed to be only benefiting some market players under the regulatory protection for an extended period. However, there is a general consensus among the market players that such delaying tactics through imposing regulatory restrictions cannot stop the inflow of new technologies for an unlimited time. It is considered that eventually the telecom markets and the regulatory regime would have to adopt the emerging realities; otherwise the country would be left significantly behind the other nations in the adoption of new ICT technologies, which will have negative consequences both in terms of benefiting the local people, and also establishing a level playing field under the competitive terms of technological multiplicity. Such barricades would also deprive the telecom users from experiencing multiple competitive solutions, in order to make most suitable choice as per their specific contextual requirements. Besides that it is further assumed that such restriction may also potentially encourage the use of illegal channels; such as the increasing trend of ‘grey-trafficking’, which would again result in huge losses to the national economy.

#### ***G.21: Dealing with the issue of excessive licensing and ‘inefficient entries’***

The regulator’s rationale for promoting competition through excessive licensing has been challenged by the established broadband and mobile operators, as they were considering it potentially a move towards jeopardizing the market’s stability and the users’ confidence over the suppliers due to the risk of ‘inefficient entries’. These ‘inefficient entries’ have been considered presumably incapable of efficiently delivering telecom services to the end-users; which results in not only the delivery of less efficient services but also potentially a cause for further intensifying the current trend of price competition and the depleting margins for the competing suppliers. The excessive licensing during the past few years for LL, LDI and CVAS is found apparently unsuccessful in creating the desired competition within those markets, apart from experiencing a moderate competition and growth in WLL market. However, in line with the Cellular Mobile Policy (2004); the regulator encourages participation from the new entrants (MVNOs) within the cellular market in possibly five different proposed ways (or business models) as explained in the ‘Framework for MVNO services in Pakistan’ (2008). This opens up the possibilities for the MVNOs’ to engage in switching & network elements, content & applications, CRM & billing,

marketing & branding, and providing the sales channel respectively. On the contrary, the established cellular operators only welcome the MVNO's assumed role in the middle parts of the value chain i.e. in developing the contents and applications, and helping in the improvement of CRM and billing solutions in order to facilitate the established cellular operators fulfilling their shortcomings. Hence, the established operators do appreciate their marginal, supplementary and backend role in complementing the value chain; however, they do not want the new arrivals to play any significant role on the front-end of the market with offering similar competitive solutions, simply due to the fear of further diminishing returns and margins in an already fiercely competitive cellular market.

#### ***G.22: Facilitating the 'Rights of Way' (RoW) and 'Infrastructure sharing'***

Getting 'Rights of Way' for building telecom infrastructure and network deployments has been critically viewed as a severe impediment for the rapid rollout of telecom networks; hence, a delaying factor in the way towards faster diffusion of telecom services. The issue has been found considerably severe in case of the metropolitan cities, particularly within the congested or densely populated pockets and the cantonment areas. On the other hand, the ineffective 'infrastructure sharing' regime even worsen the situation further, since the relatively larger and established operators have been called definitely not interested in facilitating the emerging competitors to grab their market shares using their networks. The operators also ask for the removal of inconsistencies in the adopted procedures and the differential cost structure currently set for acquiring the RoW in different parts of the country, in order to make the process more transparent, explicitly documented and harmonious; thus, to ensure a level playing field and similar treatment for all the competing operators across the country. It is considered important in order to encourage both the facility-based and services-based competition in the telecom markets for the rapid and smooth diffusion of telecom services. The adoption and effective implementation of an 'Open Access Network' (OAN) or 'Open Network Provision' (ONP) model for the access provision on competitive basis, especially in the uneconomical areas for the delivery of services, could be a significant way forward towards a fair infrastructure sharing regime; and in result, to effectively meet the USO objectives set for bridging the widening 'digital divide'.

#### ***G.23: Neutralizing the Incumbent's Control over the 'Essential Facilities'***

The increased control over the 'essential facilities' (e.g. the last mile local loops and the central internet exchange as known as 'PIE' in Pakistan) by a single dominant market player seriously questions the regulator's capability to ensure fair market competition; thus, this situation rather leads towards the dominant market structure. Hence, the incumbent's control over the essential facilities has been considered among one of the major reasons why the fixed line and internet markets couldn't flourish under the competitive market conditions, as it was experienced in case of the cellular market after the sector liberalization. Therefore, it is recommended here that control over the essential facilities should have been ideally exercised by an independent and unbiased authority, which could guarantee the presence of a level playing field for all the market players equally on the competitive terms following an explicitly documented and transparent mechanism. The regulator needs to properly address the competing suppliers' mounting concerns over this issue

through gradually neutralizing the incumbent's control over the essential facilities in order to pave the path for fair competition.

#### ***G.24: Rationalizing and effectively implementing the price & QoS regulations under one umbrella***

The Price and QoS should be seen as two tightly intertwined variables, which cannot be effectively assessed and evaluated if handled separately; both from the regulatory and supplier's perspective. It has been rightly quoted that 'a fall in QoS is a hidden price increase' (Milne, 1997 a); hence the regulator should adopt a mechanism to vigilantly check any price increase or decrease in relation with the relative change in the delivered quality of service. The efficient implementation of 'price-cap' regulation in parallel to an effective QoS regulation would likely to bring better results for achieving the desired regulatory objectives that aim at increasing the user's affordability for a reasonably good quality of service. Furthermore the 'price capping' should be done both for the 'ceiling and floor prices' in order to ensure fair business practices at the supplier's end as well. The regulator needs to watchfully check the operators' billing transparency against the presence of any 'hidden charges' and the consumers' relative level of satisfaction for the subscribed services. The consumers' level of satisfaction can be judged by both the number of registered complaints; and also by their 'willingness to pay' for the charged services, using some sort of surveys conducted at regular intervals. The publishing of the survey results in the media and at the regulator's website may also significantly help making the operators extra conscious and attentive to the registered complaints and to the consumers' feedbacks, out of the fear to not damage their public image and market reputation as reliable suppliers. The increased affordability and enhanced QoS subsequently ensures an increased adoption of telecom services. The regulator has also been recommended here to regulate the prices and QoS preferably within one regulatory framework i.e. monitored by a single supervisory team; instead of setting up two functionally disjointed teams. This is recommended for the sake of better coordination between the team members to smartly assess the changing patterns of varying relationships between the two interlinked variables.

#### ***G.25: Rationalizing the benchmarks used for mapping the teledensity***

The teledensity of the country has been counted by summing up the total number of ICT subscribers out of 100 habitants, including all three telecom services. Currently the overall teledensity in the country has been reported 69%, in which the ratio of mobile teledensity is overwhelmingly high and making above 94% of the total teledensity (i.e. around 109M as est. June. 2011), when compared with the collective number of subscriptions of the fixed line (both landline and WLL) and broadband, which is still less than 8M together. The mobile teledensity has been measured by counting the number of issued SIM cards rather than counting the actual number of users. However, the current thesis and couple of other statistics reveal that the actual number of mobile users is assumed to be considerably lower than the declared number of the issued SIM cards. Furthermore, if looked from the relative impact's perspective, then it is obvious that all telecom services do not have the same impact on society in terms of connectivity and access provision. Given an example that mobile is essentially considered and often used as a personal gadget and not frequently being shared with others; whereas the fixed line connection at home is in access of about 6 persons in average (assuming the average size of the individual household), and similarly a single payphone

(PCO) or the public booth is often in reach and use of about 100 customers of the nearby community. Similarly, in case of the internet services, a single net-café provides a shared-mode access up to hundreds of users; whereas the individual household internet access has limited number of users. Hence, it has been questioned here; whether the existing rationale behind mapping the teledensity and the set benchmarks do really reflect the actual teledensity status in the country in terms of connectivity? The current teledensity statistics is presumed to be somewhat misleading, especially when used for the purpose of policy and regulatory debates in terms of access provision and impact analysis. Hence, it is recommended here that there is a need to cross-check the validity and reliability of the current method of mapping the teledensity, especially when such benchmarks are being used for assessing the relative impacts of the diffused services in terms of bridging the existing digital divide.

#### ***G.26: Assuming an effective and well-coordinated role of CCP***

Even though the telecom suppliers and the sector regulator (PTA) did not acknowledge any significant role for CCP (the sector-wide ‘competition regulator’) in the shaping of telecom industry in terms of establishing competition; however, the number of cases addressed so far by CCP (as previously discussed) during the recent years clearly indicates an active role played by the competition regulator in the telecom sector as well. It is expected that the role of CCP would further enhance in the future as the markets would expectedly further liberalize; and in result the competition would gradually grow, particularly in the broadband and WLL markets. Furthermore, the mobile sector would also likely observe an increased mandate of CCP when the market consolidation would start taking place through a couple of expected mergers and acquisitions as soon the 3G licensing process would be officially announced. An effective role of the competition regulator ensures a free and fair competition in the sector; whereas the healthy competition is an indication of the market’s expected growth. However, it is recommended here that the role and mandate of CCP should be exercised in good coordination and through well-received acknowledgment by the sector regulator and other market players. Hence, the competition regulator should not be considered as an ‘exogenous’ entity, which is seen as unnecessarily trying to infiltrate beyond its mandate. In this regard, PTA should hold some sessions with CCP in order to delineate some mutually agreed protocols and mechanisms and to clearly outline how to address the competition related issues. It is because, when dealing with the competition-related issues, the operational mandate and the respective boundaries of the two regulatory authorities may overlap; hence it may potentially lead to a ‘role conflict’ situation between the two respective institutions in the future’s context.

#### ***G.27: Addressing the ‘Numbering’ Issues***

The tremendous growth in the mobile sector over the past few years has highlighted the importance of the ‘scarce’ resource of allocated numbering blocks, which were previously considered as an ‘abundant’ resource. The significance of an effective ‘numbering plan’ both in terms of the number allocations (by regulator to the operators) and the subsequent number assignments (by operators to the end-users) has been increasingly acknowledged for the smooth functioning of the fixed line and mobile markets. The regulator is required to be vigilant to regularly check the efficient use of the allocated numbering blocks. Furthermore, the competition grows when the ‘number portability’

regimes are effectively functioning, and the telecom users also get benefit out of this facility. However, currently in Pakistan only the ‘mobile number portability’ (MNP) regime has been called as effectively functioning; but on the other hand, the possibility of ‘fixed number portability’ (FNP) is still absent, which again refers to one of the reasons for the differential scale of competition and the consumers’ varying level of satisfaction with the two compared services. The regulator needs to immediately and effectively enforce FNP in order to facilitate the fixed line users and to also encourage the desired competition in the fixed line market, as experienced in case of the mobile market after the introduction of MNP.

The second important issue within the numbering debate is the increasing trend of ‘number trading’. The ‘numbers’ are now treated and traded here just like a commercial commodity in the open markets, and their rates are also bargained as per the charm of the traded number. However, such a practice of open market number trading has also caused for some additional issues, both in case of the fixed line and mobile services. It has been noticed that it is now quite unlikely to get the requested or a desired number through telecom suppliers by following a straightforward procedure or a transparent mechanism. In case of the fixed line, the problem gets even worse, especially when such numbers are requested for the shops and offices in the commercial areas of metropolitan cities. The ‘number trading’ seemingly has become such a lucrative business that even some dedicated websites and shops are openly trading these numbers at quite a large amounts, especially in case of the most in-demand numbers. Moreover, sometimes even the unwanted calls may expectedly be received by unknown persons asking for their desired numbers. Looking from that perspective, it is recommended that the regulator should check this issue properly and enforce an effective regulation in order to stop the negative consequences of such practices; such as the violation of individual privacy due to the reception of unwanted trading calls, the problems of corporate or commercial users in getting the desired numbers, and the possible involvement of the individual employees of the operating firms in these rate fixing and trading activities for their personal gains (set margins).

#### ***G.28: Adopting an Effective Dispute Settlement Mechanism***

The ‘dispute settlement’ refers to an established mechanism designed to properly handle different kinds of possible conflicts or disputes between the suppliers, users and various institutions. Some of these disputes are settled down with the mediation of PTA and CCP or by the involvement of civil and consumer courts, depending on the nature of a particular case. However, there could be possible occasions, particularly in case of the inter-institutional conflicts (e.g. dealing with the issue of the ‘role-conflict’), in which case there is apparently no explicitly documented procedures for resolving such situations. In the absence of a clearly outlined mechanism, there remains a certain degree of conceptual ambiguity, which needs to be properly addressed. An efficient and transparent mechanism for the ‘disputes settlement’ enhances the level of trust of the telecom market suppliers and users upon the policy and regulatory domains.

#### ***G.29: Regulating the Restricted use of multiple SIM cards***

The increasing trend of issuing multiple SIM cards to individual customers may result in negative consequences for the suppliers, law enforcement agencies and the telecom users as well. In case of the suppliers, it costs them additional in terms of ‘network redundancy’ and an inefficient use of the



assigned numbers; besides paying an extra amount to government on the accounts of ‘activation tax’ and annual ‘spectrum fee’ which are due to be paid as per the number of issued SIM cards, no matter whether they are in use or not. For the law enforcement agencies, it creates additional trouble in terms of tracking down the culprits if the criminal offense has been committed with the help of an unidentified (i.e. not properly registered) SIM card. Finally, for the end-users the issuance of unregistered and multiple SIMs to individual subscribers may potentially result in the violation of their privacy due to the risk of frequently receiving unwanted and obnoxious calls and messages from unknown numbers. Hence, the primary responsibility lies on the shoulder of regulator to effectively enforce a regulation that could ensure only a restricted number of SIMs to be issued to an individual, but after strictly following due verification and registration process.

***G.30: Regularly assessing the ‘impact analysis’ using multiple schemes in order to observe the scale of variance between the desired and actual impacts of the use of ICT***

The affordable access provision and the delivery of good quality ICT services still presents only one part of the story; and thus, the diffusion analysis remains incomplete unless the second part of the story has also been thoroughly investigated, which is called the ‘impact analysis’. The diffusion analysis is not just about studying the ‘rate of adoption’; but more importantly it is about the ‘effective and productive use’ of those adopted ICT services for the desired objectives. As previously insisted for the policy maker; it has also been emphasized here in case of the regulator to properly acknowledge the importance of conducting such studies for the ‘impact assessment’ at regular intervals in order to correctly measure the relative impacts of the diffusion of different telecom services on the users in terms of their social betterment, economic uplift, political empowerment, enhanced learning and awareness, and an increased work efficiency. For such assessments, different analytical schemes (e.g. surveys, individual interviews, focus group discussions, visual documentaries etc.) could have been employed simultaneously to additionally cross-verify the authenticity of the collected data. The current thesis reveals that there is often a certain degree of variance between the desired objectives and the resulted or actual impacts of the diffused telecom services. Hence, the results of such regularly conducted ‘impact analyses’ could be effectively used to gauge the scale of prevailing ‘digital divide’ in order to make the subsequent adjustments.

### **11.4.3 Supplier Domain**

***G.31: Improving the Quality of Service (QoS) and ‘Responsiveness’***

The poor QoS and slow responsiveness remain among the highest concerns of telecom users. Among the three compared telecom services, internet has been pointed out as delivering the poorest QoS in terms of ‘usage experience’; whereas the fixed line service has been rated as poorest in terms of ‘responsiveness’ to the users’ generated complaints and queries. In case of internet, the issues include the frequent connection breakups even during a single session of usage, and secondly the very slow data rate; as particularly highlighting the variance between the promised and actually delivered data rates, both in case of the dialup/DSL and broadband wireless internet access. In case of fixed line and mobile services, the QoS issues include the poor voice quality due to the noise and interference, and the bad customer services. On the other hand, the major issues in case of the fixed line related to the poorest ‘responsiveness’ include the delayed response time in fault attendance and reparation, and the frequent re-occurrence of already attended faults, possibly due to being

poorly repaired in the first place. The consumer rights issue has also been discussed with respect to the lack of courtesy, communication ease and an individual attention, which was expected to be paid by the customer services to each individual query. Even though the fixed line service has significantly improved its response time over the years particularly in case of requesting for the new connection; however, the users still rank the fixed line as the poorest among the three compared telecom services in terms of the time required for the line activation. The telecom suppliers are recommended to particularly focus on improving their QoS and responsiveness in order to improve their image in the public as reliable and responsive suppliers.

### ***G.32: Addressing the issues related to 'connectivity', 'access', 'coverage' & 'network optimization'***

Since the above listed issues are closely interlinked with each other; hence, they are discussed here together. The 'coverage' is available at some location when the network facilities have been deployed after evaluating the feasibility of the business case, or by improving the coverage of the existing installations with the help of tele-traffic engineering and through network planning and its optimization. The term 'access' has been understood here as the 'last mile' connection i.e. the availability of a telecom service to a user terminal; whether it is a mobile, household connection or a share-mode public access point. Finally, the term 'connectivity' has been referred here to indicate the availability of a sustainable connection after making the first request for a service each time, and then having that connection alive until the user itself disconnects it.

The network coverage has been found primarily the issue for the fixed line and internet services, since mobile currently has the most extensive countrywide coverage; however the mobile networks still need to go through the consolidation phase through employing improved network planning and optimization techniques, and that is the focused area where the cellular operators have been found already struggling for. The cellular (mobile) services have also been considered susceptible to 'call dropping' and poor 'signal strength' related connectivity issues. The coverage of broadband wireless is still limited to the major towns and cities; whereas the fiber deployments are extensively done, but mainly the 'dark fiber' to support the operators for the inter-city backhaul transmission. On the other hand the HFC and FTTH/FTTB based access solutions are quite limitedly available (est. 2011) only in some parts of the large metropolitan cities. In order to bridge the last mile access issue to deliver voice services, the fixed-wireless (WLL) networks have been extensively deployed to replace the need for the copper wires. The copper and fiber deployments as access solutions severely suffer from the mounting cost factor; due to an uneconomical cost structure, particularly in case of the network expansion in rural areas. Whereas, the wireless broadband access solutions essentially suffer from the small radius size of the single BTS coverage; particularly in the presence of no 'cell handover' possibility due to the regulatory restrictions, since WiMAX operations are based on WLL license which doesn't allow roaming or cell switching facility. On the other hand, the mobile broadband is relatively a more robust solution both in terms of 'access' and 'connectivity' even when on the move, but it essentially then suffers from the relatively much lower data rate and the higher service charges. Hence, to address the above discussed issues, it is recommended here that the fixed incumbent should make an optimal use of its already deployed copper network; since still currently more than half of its deployed copper lines are left redundant.



Therefore, it is recommended to bring this idle network into use by offering a special ‘line-rent free’ package for a promotional period (say for 2-5 years) until the ‘critical mass’ is achieved in order to stimulate its demand; otherwise it is most likely that the whole 10M landline capacity would eventually become obsolete. The future of telecom ‘access’ solutions is likely to be a gradual move from copper towards fiber and wireless technologies. In the future’s projected scenario, a telecom user would expect an omnipresent (ubiquitous) and seamless connectivity for supporting its all voice, data and video communications related requirements under one subscription, regardless of whatever underlying access and transport technologies have been employed by different integrated telecom suppliers.

### ***G.33: Ensuring the networks’ regular up-gradation and maintenance***

The declining QoS and the diminishing demand for the landline telephony has also been attributed to the fixed incumbent’s declining investments on the maintenance and up-gradation of its countrywide copper network; due to which the condition of its copper installations is reportedly deteriorating day by day. The incumbent’s investments have been seen essentially focused on upgrading its switches i.e. completing the transition from PSTN towards NGN, and secondly on the deployment of fiber at the backbone and access level. Hence, it has been recommended here that in order to keep its landline business alive for the provision of both voice telephony, and to support the dialup and DSL based internet solution; the fixed incumbent has to invest on maintaining and up-grading its copper networks. It has been also recommended to other telecom suppliers to acknowledge the fact that in order to survive in the future’s competitive landscape, which would be largely based on the competing supplier’s scale of innovativeness; they would have to continuously up-grade and modernize their existing network facilities to be capable of delivering state-of-the-art innovative services to telecom users.

### ***G.34: Understanding the product’s ‘Relevance’ and ‘Context of Usage’***

The products and services which demonstrate high degree of ‘relevance’ as per the ‘context of usage’ of the targeted user communities are expected to be widely adopted, if the other variables were also found suitable. This includes the product’s ‘compatibility’ with the prevailing social norms and values, user’s existing needs and specific requirements, and his/her perceived expectations from the new service. Hence, the lack of relevance or the scale of incompatibility of the new product has a direct relationship with the degree of ‘social inertia’ it is expected to face in its subsequent diffusion within that particular community. Hence, it is expected that those telecom services which would offer relevant contents and embedded applications with reference to the users’ daily life context would likely experience higher adoption rate. The user survey reveals that the level of ‘application barrier’ (i.e. the lack of relevance and usefulness in terms of the product’s usage and its alignment with the users’ real needs within their daily life context) has been reported highest in case of the fixed telephony as compared to other two telecom services. It is important to remind here that the survey was primarily conducted from the university students, who were expected to be relatively more ‘nomadic’ and frequent users of different ICT applications. Hence, the above result makes sense; especially knowing the fact that mobile has almost replaced the need for having an additional fixed line phone merely for the purpose of voice communications.

However, it is assumed here that if the survey would have been conducted among the general masses, then most expectedly they would have considered internet as among the least relevant telecom services; due to the lack of relevant applications and its use in context of the common man's daily life activities, the lack of 'computer-literacy' or IT-skills, and due to the faced 'language barrier'. The majority of population living in the rural areas has actually no clue about the use of internet and how it can be helpful to them for their social, economic or political empowerment. Apart from these rural communities, even a large number of academic and public-sector employees were also found quite unaware of the real potential of internet, and the range of useful and relevant applications that could have facilitated and improved their efficiency and performance at work. Hence, the telecom suppliers are recommended here to develop such applications which could be considered as fully relevant and well-embedded within the context of usage of the targeted user communities.

#### ***G.35: Increasing 'Personalization' by offering 'user-oriented' packages with an increased 'scalability' and 'flexibility'***

The service 'personalization' feature essentially includes the product's intrinsic attributes of 'scalability' and 'adaptability', which allow the users to adjust and adopt the product as per their own specific needs and requirements. Hence, for an increased service 'personalization' the suppliers should not insist on 'one size fits all' approach. However, an increased user-control over product requires the supplier to also increase its focus on user-oriented product development and its subsequent diffusion. Therefore, it is recommended that the users should be let design and plan a service package that suit them most as per their particular context of usage. The suppliers should avoid unnecessarily bundling the services in their offered packages; and they should offer such sort of flexible, scalable and adaptable packages where the users could decide themselves what services (or selected features of a service) they essentially need to be included in the package and what else should have been removed from the list, and hence they should be billed accordingly. The 'Unbundling of service' has also been given the provision (clause 4.6.4) in the 'deregulation policy' (2003), as emphasizing on the principle of transparency in this process. Introducing 'unbundling of services' would also help customers avoid paying unnecessarily for the unused or undesired services.

#### ***G.36: Ensuring the billing transparency and avoid 'Deceptive Marketing'***

The billing transparency issue has been found among the major concerns of the telecom users as per the current survey. In the users' perception, the wrong billing and lack of transparency element is highest in case of the fixed line service, followed by mobile and then the internet services. In this respect, five recommendations have been made here to help telecom operators address this issues comprehensively; and thus to enhance the users' trust and confidence over the suppliers, and subsequently on the consumed telecom services. The first step would be the removal of all sorts of 'hidden charges' (if any exist), which are often implicitly included in the consumers' bills without having them properly informed about those hidden charges and taxes, explicitly in the media campaigns and the subscription contract. The second step would be to simplify the billing document itself by making all the required details and the list of charges explicitly mentioned under different categories. The third step would be to encourage the user's access to the online billing and payment solutions, so that the users could verify the billing authenticity and could also make objections online in hope to receive a justifiable response within three working days. The fourth step would be

to reduce the multiplicity of ambiguous and tricky packages, as frequently seen being offered by the suppliers with less clarity (esp. in case of the mobile services); and therefore they are often accused for being engaged in ‘deceptive marketing’ practices. The facts should be declared without any complexity in very simple words, even understandable to a common man, without making any presumptions about the ‘pre-understood facts’; while knowing the reality that an overwhelming majority of the Pakistani population is still incapable of understanding these ‘complex details’. Finally, the transparency element can be further increased by being honest to the customers while charging them only for the consumed services; hence, removing any discrepancy between the promised/declared and the delivered/consumed services.

### ***G.37: Competing on the basis of ‘Value-added’ (VAS) & innovative services for an increased ARPU and reduced ‘Churn Rate’***

The current trend of declining ARPU; and therefore the depleting returns on investments for the suppliers can be overturn if the bases of competition were shifted from the currently experienced cut-throat price competition towards competing on the bases of innovative and value-added services (VAS). There are two basic approaches (keeping aside at the moment the third approach of ‘product segmentation’) to increase the product’s sale, as discussed in the strategic literature (Porter, 1980): One is to reduce the product’s price either by reducing the production cost or by squeezing the profit margin (i.e. the ‘cost leadership’); and the second approach is to increase the ‘perceived’, ‘delivered’ and the ‘experienced’ value of the product (i.e. the ‘product differentiation’), and the current discussion is about probing the second choice. Enhancing the product’s value in the users’ perception would also help in increasing the customer’s loyalty with a specific product and consequently with its supplier as well. Hence, it is expected that it would also help in decreasing the currently observed high ‘churn rate’, which is seriously bothering the telecom suppliers. Another way to handle this situation; particularly in case of the mobile services, would be to significantly enlarge the attractiveness of the ‘postpaid’ subscriptions through an increased scale of offered incentives for those subscriptions, as compared to ‘prepaid’ subscriptions. These incentives could be both ‘application-oriented’ i.e. introducing new enticing applications just for the postpaid subscribers; or they could be also financial-based incentives i.e. by offering cheaper rates when consumed the services above a certain level of usage. Adopting these strategies may help the operators turning the image of postpaid subscription in the customers’ mindset as a new perceived ‘status symbol’; in a country where 95% of the mobile subscribers are still on the prepaid.

### ***G.38: Facilitating users in overcoming the technological ‘Complexity’ and ‘Usability’ issues***

A product’s ‘complexity’ has an inverse relationship with its ‘usability’, which means that as the product’s complexity increases, its usability (in terms of the frequency of usage and the relative comfort of working with it) decreases accordingly. On the contrary, the more a particular service and its related applications would be made ‘user-friendly’, the higher would be its usability; if the other variables were also kept favorable. In this context, it is also important to understand the difference between the general literacy and the ICT-literacy, which refers to the fact that even a highly qualified and learned person may also possibly be quite unfamiliar with even the basic usage skills of ICT products; hence feeling highly hesitant in interacting with different ICT services as well. On the other hand, a large number of people with relatively very little formal education have

been found as highly skilled users of different ICT devices, services and a wide range of relevant applications. This clearly reflects that the technological ‘complexity’ issue should also be seen and addressed separately from the other governmental level campaigns that primarily aim at increasing the general literacy rate and formal education in a country. Hence, in this context the telecom suppliers’ primary concern should be associated with an increased ICT literacy, and with reducing the product’s scale of complexity in order to increase its usability and adoption among the masses.

#### ***G.39: Addressing the ‘price affordability’ issue through analyzing the ‘Price Elasticity’ of each targeted user-community***

In a country where having an average broadband monthly subscription costs around 10% of the average user’s monthly income (considering the fact that the GDP/capita from purchasing power parity perspective for a Pakistani consumer is barely \$2400/annum<sup>91</sup>); the service ‘affordability’ issue then definitely becomes a decisive factor in the diffusion analysis. It is important to also acknowledge the fact that such assessments about the average GDP/capita do not take into consideration the relative patterns of distribution and concentration of wealth in a society in terms of the ‘economic disparity’, which is also reportedly too high in case of Pakistan. Hence, in fact it portrays even a further miserable situation of a common person as seeing from his/her ‘buying power’ perspective. There is apparently present a high degree of ‘price elasticity’, especially in case of those user groups where the demand for a specific service is high on the real need basis but the affordability is very low: such as in case of the use of internet among the university students and researchers for the learning, education and research purposes; and the use of mobile phone for voice communication purpose among the poor labor and middle class people working away from home. In such cases, it is assumed that the drop in prices may significantly stimulate data and voice traffic. However, the real challenge remains to precisely finding out that in practice how such ‘differential pricing’ schemes would be implemented transparently in order to achieve the targeted objectives. However, different strategies can be employed in order to keep the adopted pricing structure and the offered subscription schemes in line with the desired objectives, and to also ensure the element of transparency is maintained. The survey additionally reveals that the fixed line charges have been considered unjustifiably high, especially in the presence of an excessive fixed line rent. As recommended above, if the fixed line rents were withdrawn (say initially for couple of years) for the all new subscribers and for those current subscribers as well who connect one new subscriber with the fixed net with their reference; it is expected that such an offer may highly stimulate the growth of fixed line services.

#### ***G.40: Controlling the administrative and financial mismanagement issues***

The supplier’s administrative inefficiency and mismanagement has a negative impact on the customers’ mindset both in terms of the perceived image of the supplier and the subscribed services. The supplier needs to control over any administrative or financial mismanagement that may damage its image and credibility in the market, as a trusted supplier. The supplier also needs to minimize the required amount of bureaucratic procedures and unnecessary formalities required to be fulfilled in order to interact with the supplier for resolving any issue or pursuing a query. The queries and

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<sup>91</sup> <https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html> (Accessed on 15th January, 2011)

complaints of the customers should be entertained efficiently and effectively in the shortest possible time without let them going through any bad experience. The survey result reflects that the fixed line service has been considered more vulnerable to the administrative and financial mismanagement cases when compared with the other two services, as perceived by the respondents based on their personal experiences and general impressions.

#### ***G.41: Ensuring data & transactional security in the e-banking & e-commerce applications***

The observations, interviews and survey results all reflect that the consumers were largely unaware about the existence of any online (or mobile) banking solution or the availability of e-commerce applications. There have been noticed multiple issues that need to be effectively addressed before the mobile and internet based online services could be expected to proliferate among the masses to be fearlessly used for the banking applications and financial transactions. Firstly, there is currently a limited supply and an extreme lack of awareness among the masses about such applications. Secondly, even if there are some applications developed by some mobile operators and banks, then they have not been marketed in a way to have proved themselves capable of delivering a full-fledged solution, considered as compatible with the users' manual experience of being physically in a bank or at a shop themselves. Thirdly, those solutions have not been made sufficiently interactive and simple enough to encourage a common man to dare using those services fearlessly and comfortably. Finally, the 'data security' issue becomes a bottleneck here, since people were found highly skeptical when considering to adopt such online options due to perceiving a high degree of risks involved in disclosing their personal data and visa card (bank card) details on internet or using their mobile phones; out of the fear that those details might be stolen or misused by some intruders or by the staff of the utility companies, online stores or even by the bank officials themselves. Until the provision of strict regulatory protection and a clear assurance from the supplier firms guaranteeing against the occurrence of any such fraudulent practice, or at least offering a full compensation in case of suffering any financial losses due to facing data-security related issues; it is quite unlikely to experience a mass scale adoption of these online applications in the near future.

#### ***G.42: Becoming part of the local & global 'Innovation Networks'***

The suppliers generally do not perceive themselves capable of independently organizing the whole value chain for an efficient delivery of telecom services to the end-users, all by themselves; while fully realizing the presence of highly complex techno-economic webs of inter-firm relationships in today's extremely competitive telecom markets. Hence, they frequently engage in many parts of their value chain with the other suppliers and market players by maintaining different forms of business relationships. These include the strategic partnership among the supplier/buyer firms in the long-term horizon; and different forms of 'innovation networks' at the local and global scale such as the strategic alliances, joint ventures, out-sourcing and sub-contracting modes of business relationships. The research reveals that most of the supplier firms consider themselves more like 'system integrators' than assuming themselves as 'sole suppliers', acknowledging the fact that they essentially or primarily work as 'coordinator or integrator' among a range of other participating suppliers in the value chain; in order to deliver the finally shaped 'value' to the end-users.



Hence, it has been generalized here that those firms which are more effectively engaged in some forms of ‘interactive loops of learning’ and value-creation activity with different innovation pipelines or networks; would have presumably a comparative and competitive advantage over their rival firms, which are operating relatively in isolation. This is due to the fact that in comparison to being in isolation, the better integration would give an additional opportunity of learning from the experiences of other participating suppliers; in addition to the fact that they would also have access to cost-effective solutions by integrating the required skills and competencies into the desired value-creating network on the need-basis, instead of permanently hiring or employing those competencies. Hence, this is one of the recommended ways to reduce the mounting ‘fixed costs’ by marginally increasing the project-based ‘operational costs’ (in terms of paying the fixed-monthly salaries if those temporarily required competencies had to be permanently hired). A country where the telecom suppliers are well-integrated with the global innovation networks is likely to experience better range of innovative products and applications, thus it may also expect then a healthier growth in telecom markets. Currently, the mobile operators in Pakistan are considered to be relatively more integrated with those global innovation networks than the broadband and fixed line suppliers.

#### ***G.43: Improving the product’s Intrinsic attributes***

The ‘intrinsic’ attributes are those features which are essentially considered internal and inherent to a specific product or service; as opposed to the ‘extrinsic’ attributes which are generally considered as external to the product itself, but those external factors and elements may significantly affect the diffusion of any technological product. Apart from some of the intrinsic attributes, which have already been discussed earlier such as ‘complexity’, ‘usability’, ‘affordability’, ‘relevance’, ‘scalability’, ‘safety’ (health) and ‘security’ (data/transactional); the rest of the intrinsic attributes which have been considered by the respondents as crucial to the successful diffusion of telecom services are ‘portability’, ‘mobility’, ‘interactivity’, ‘robustness’, ‘aesthetics’ and ‘ergonomics’. The mobile services definitely stand ahead in the provision of ‘portability’ and ‘mobility’ features as compared to other telecom services. In case of ‘mobile internet’ and broadband wireless internet services, the portability and mobility features can be significantly improved particularly if the prices for the laptops are significantly dropped to an affordable level; whereas in case of the fixed line, the extended range of WLL operations may help improving its mobility and portability features. However the current regulatory restrictions on the WLL and WiMAX mobility severely restrict the suppliers’ choices to improve these intrinsic features within fixed line and broadband services. Hence, in this context again, the mobile service undoubtedly has a clear edge over the other compared services.

From the user terminal’s perspective, the landline phone-set is relatively ahead in terms of providing the physical ‘robustness’ as compared to the mobile handset and the portable computing gadgets such as iPad or laptop; however in terms of relative ‘interactivity’, ‘aesthetics’ and ‘ergonomics’, the landline phone and fixed line service has been considered standing at the bottom, due to largely being perceived as basically an unattractive ‘dump-box’ by the respondents. Hence, here again the mobile phone (and service) stand high due to its highly interactive features and applications, the inherent ‘aesthetic’ charm and the relative comfort in its use (i.e. ergonomics). That reasonably explains the other important reasons behind the rapid adoption of mobile services. Hence, the broadband and fixed line operators have to profoundly think about the intrinsic attributes

of their delivered telecom products and services; in an effort to considerably improve the comparative position of their products and services in the telecom market.

#### ***G.44: Managing customer relations and caring about the consumer rights***

It is an accepted wisdom that the ‘customer remains pivotal in all business relations’; since, if the customer once gets upset with or develops a negative perception about a particular service or the operator, then it’s quite costly for the supplier to make him/her change the mindset again. Particularly in an increasingly competitive telecom market, the ‘customer retention cost’ has been called escalating day-by-day due to the increased realization by the companies that once they start losing their customer base, it may have significant impact on the other customers’ perception as well; hence, that may potentially create the ‘negative network externality’ effect in a network industry like the telecom market. Also as a matter of fact that the ‘customer acquisition cost’ has been counted as significantly higher than the ‘customer retention cost’; therefore, the companies are now increasingly worried about maintaining their relations with their existing customer base. Furthermore, in the wake of an increasing awareness among the telecom users about their consumer rights, there is a new wave of upcoming challenges that the suppliers would have to deal with, while no more considering the consumers as ‘passive recipients’ of the technological services delivered to them with the previously dominant ‘technology-push’ realm.

Hence, merely the establishment of ‘customer relationship management’ (CRM) department; and outlining the cosmetic policy statements about the ‘corporate social responsibilities (CSR)’ would definitely not be sufficient to any extent to effectively address the critical importance and complexity of this demanding issue. The suppliers need to bring the customers on-board, and make them an essential part of the value-chain and the consensus-building process during the products’ development and its subsequent diffusion. The suppliers need to strengthen their ties with their customers by inspiring them with the feeling of being part of a larger ‘community’; and moreover endeavoring to not just ‘satisfy’ but to ‘delight’ their customers with the adopted business practices. The suppliers need to deliberately create such occasions and opportunities that could inspire the users to an extent that the customers could be ‘voluntarily hired’ for the company for their word-of-mouth marketing services. But that would demand from the suppliers to challenge the whole foundation and the underlying assumption of their existing business practices in order to achieve that inspiring objective. Table 14 summarizes some of these recommended business values and practices that could be adopted by the suppliers in order to reach that goal.

#### ***G.45: Creating ‘demand-side economies of scale’ through content development & market awareness***

This is one of the focal point that has been extensively debated in this thesis, which emphasizes that the conceived benefits of the well-known ‘economies of scale’ phenomenon can be also achieved from the demand-side perspective. The supply-side economies are generally achieved with the help of ‘mass production’ i.e. by receiving an increased supply order; since the marginal cost of producing each additional unit then considerably drops down as compared to the average cost of production. However, the demand-side economies of scale essentially focus at how to create the increasing demand which could self-reinforce itself, even without employing the traditional cost-



leadership strategy of price reduction. One of such most acknowledged way would be to raise the appetite for the delivered services by developing useful and relevant contents and applications within the local context; in order to stimulate the usage and increase the demand for the delivered services. The delivered service itself is merely a pipeline which has no worth until the highly demand-creating contents are flown through it. These contents should be preferably in the local languages or at least in a language which could be commonly understood by most of the people, say the Urdu language for example; since as a national language, it has been widely spoken, written or at least understood among the majority of population. This would also be a considerable move towards overcoming the ‘language barrier’ that largely prevails due to the presence of an overwhelmingly large proportion of internet contents in the English language, which is not understood by a very vast majority of population. Another important step in this regard would be to run mass campaigns, preferably together with the other suppliers while also having the essential support of the other domain; in order to create public awareness for understanding the usefulness and relevance of the developed contents and applications within their local context, so that they could vividly see how they can be benefited out of the productive use of the delivered ICT services.

#### ***G.46: Increasing the bandwidth capacity and consolidating the international connectivity***

The suppliers need to invest in increasing their existing bandwidth capacity in order to efficiently support the expected surge in the volume of voice and broadband traffic in near future. It is presumed that currently there is a disproportional balance between the volume of incoming and outgoing international traffic; somewhat in a similar pattern as we generally observe in our daily usage of internet and telephone services i.e. a disproportionally high downloaded amount of contents and similarly the received amount of international calls (if we have friends and relatives living abroad) as compared to the uploaded contents and the dialed international voice calls. It has been considered that it may be because Pakistan has not been seen so far a major ‘content-producer’ country; besides the fact that there is also relatively much less international outgoing voice calls for the international uplink channels. However, it is further presumed that this pattern may significantly change once the relevant content development activities start taking place within the country that would also be presumably in demand of the foreign people, particularly for the Pakistani expatriates living abroad in large numbers. The current pattern may also significantly change in case of the international outgoing voice calls as well, when there would be expectedly more business activities and further internationalization of local businesses. Hence, it is recommended that the suppliers should take these projected scenarios into account in order to get prepared for the forthcoming challenges in terms of facing any shortage in the currently available bandwidth capacity.

Secondly, there is also a need to further consolidate the international access and connectivity, which is currently only dependent on the undersea fiber cables; and at times of technical failures or suffering from undersea cable-cuts for some reasons (as experienced several times in the recent years), the whole country’s communication system comes to a grinding halt. This is a significantly worrying scenario, knowing the strategic importance of telecommunications not just for the commercial and social applications, but more importantly in terms of securing the national interests. Hence, it has been recommended here that there should be deployed multiple backup systems (such

as the satellite and terrestrial based communication links) in order to support the country's international connectivity at times of disasters.

#### ***G.47: Reorienting the adopted business values and market practices***

Finally, the respondents highlight some issues that actually relate somehow with the corporate values and the business practices of the telecom suppliers, which are required to be addressed. Hence, the author proposes here a list of recommendations for the supplier domain, which is also the reflection of the author's personal observations of the generally prevailing business culture in the country, regardless of any specific industry. It is believed that a sustainable change and reform process always starts with positively changing or eradicating those deep-rooted, but sometimes misleading 'underlying beliefs and values', which are found to be counter-productive. Hence, the sustainable growth of telecom market, and subsequently the rapid and productive diffusion of telecom services essentially require effective learning and adaptation of the best practices, while at the same time having the courage to discard the obsolete and retarding elements from the equation. The following recommended list of business values and practices is quite self-explanatory.

	The prevailing business values & practices in Pakistan	The recommended business values & Practices
1.	Firm-centric and individual growth	Market-oriented and industrial growth
2.	Maximization of Ownership through increased market control	Maximization of growth through increased participation in the collaborative networks
3.	Supply-driven & profit maximization	User-driven & value maximization
4.	'Win-lose' mentality for the capture of scarce resources – 'Survival of the fittest' Following the 'red-ocean' strategy	'Win-win' approach for the creation and discovery of yet untapped and unlimited resources Following the 'blue-ocean' strategy
5.	Destructively competitive	Innovation-led competitive
6.	Reactive approach – Following the trend	Proactive approach – Setting the trend
7.	Short-term profit seeking (opportunistic)	Long-term and sustainable benefits (visionary)
8.	Transaction-led business relationship	Honesty and trust-based business relationship
9.	Implicit and vague in communication	Explicit and transparent in communication
10.	Disorganized, uncertain & chaotic	Strictly organized, determined & disciplined

Table 14: A Recommended List of Business Values and Practices for the Supplier Domain

Source: Author

### **11.5 Some Concluding Remarks**

In line with the initially raised research questions in beginning of the work; this thesis remains focused on inquiring and exploring the field data in an attempt to develop a detailed account on the posed questions. As the title of the thesis suggests, this work has been primarily an attempt to expanding the concept of the diffusion analysis to the case of telecom services, in a socio-economically complex unit of analysis. 'Complexity' has been seen here in terms of varying translations led by different competing interest-driven groups, largely in the absence of an organized, systematic, transparent and explicit behavior; and thus resulting in chaotic and unpredictable outcomes, and uncertain impacts and consequences of the diffusion and adoption processes.

The industrial mapping of the telecom market has been done in order to identify the involved actors and major stakeholders, their specific positions and assigned roles, and accordingly the expected patterns of their interactions in the current framework. The thesis attempts to discover the whole range of potential forces, factors and reasons that might possibly influence the pace of adoption and diffusion of the compared telecom services within the given context of analysis. Hence, this comparative analysis of the relative diffusion of the compared telecom services identifies both the service-specific and context-specific diffusion attributes, which clearly explain the relative difference in their diffusion. The thesis also discloses those major bottlenecks which cause to impede the growth and development of telecom sector.

The thesis identifies the social, political and economic impacts of the diffused telecom services in terms of the observed and potential changes in the adopter's level of competence, efficiency and empowerment; while comparing the pre- and post-adoption changes in their attitudes, work practices and the resulting outcomes. Due to the lack of trust and transparency elements, this thesis has been remained highly focused on understanding the patterns of translations; in order to find out how the competing 'translations' led by the different 'focal' (or leading) actors actually strive to promote their own versions of 'truth', to protect their specific political and economic interests associated with a particular pattern of the diffusion and adoption of telecom services. The thesis has been then concluded with a comprehensive list of policy, regulatory and strategic recommendations for each individual domain of analysis; in order to help them designing an effective policy & regulatory framework and an optimal strategic roadmap, which should be capable of addressing the observed challenges, as identified during the analysis. It is expected that the explanations made by this research would significantly help the policy makers (telecom ministry), regulators (both sector-specific & sector-wide), and the telecom suppliers (primarily the operators and service providers) in understanding the dynamics of the diffusion process, in case of telecom services within a complex socio-economic context. The work is deemed to be highly relevant and useful for the academics and researchers interested in this research area. This is believed that the depth and breadth of this analysis would strengthen the credibility and authenticity of the results produced by this research.

### ***Study Limitations***

Here, it is also important to admit certain limitations of this study. This study suffers from the time constraint, which doesn't allow cross comparing the validity of the achieved results with the other technological sectors within the country in order to identify the scale of variances; and also to cross comparing with the relative diffusion patterns of telecom services in other regional (developing) countries, which are more or less similar in terms of exhibiting the articulated characteristics of the socioeconomic complexities, as observed in case of Pakistan. Such a broader study would expectedly reveal further interesting results, and would definitely bring fresh insights on this demanding research area; in order to benefit not only the policy and regulatory domains, but equally to the supplier, user and the supporting domains. Hence, this study should only be considered as a point of departure towards the declared standpoint on the diffusion analysis; however, a detailed inquiry is still required from the other researchers to shed light and unearth many of yet unexplored dimensions of this highly unsaturated and blooming research area.

## Abbreviations & Acronyms

ADC	Access Deficit Charges
ADSL	Asymmetric Digital Subscriber Line
ANT	Actor-Network Theory
APC	Access Promotion Contribution
ARPU	Average (monthly) Return per User
ASR	Approved Settlement Rate
ATM	Automated Teller Machine or Cash Machine
B	Billion
BBC	British Broadcasting Corporation
BCG	Boston Consulting Group
BEMIS	Balochistan Educational Management Information System
BoP	Bottom of the Pyramid
BSC	Base Station Controller
BSG	Broadband Stakeholder's Group
BSNL	Bharat Sanchar Nigam Ltd. (Indian Telecom Incumbent)
BTS	Base Transceiver Station
CAPEX	Capital Expenditure
CB	Citizens Band
CCP	Competition Commission of Pakistan (Pakistan's Competition Authority)
CD	Cabinet Division
CDMA	Code Division Multiplexing Access
CDR	Call Detail Records
CLI	Calling Line Identification
CMC	Computer-Mediated Communications
CoE	Center of Excellence
CPE	Customer Premises Equipment
CPP	Calling Party Pays
CRM	Customer Relationship Management
CSR	Corporate Social Responsibilities
CTI	Carrier Telephone Industry
CVAS	Class Value-Added Service
DGs	Diesel generators
DoS	Denial of Service
DRM	Digital Rights Management
DSL	Digital Subscriber Line
DWDM	Dense Wavelength Division Multiplexing
EDGE	Enhanced Data rates for GSM Evolution
EPA	Environmental protection authority
EvDO	Evolution-Data Optimized or Evolution-Data Only
EVO	Abbreviation of EvDO (a branded name of PTCL's wireless broadband service)

EU	European Union
FAB	Frequency Allocation Board (Pakistan's Frequency Allocation Authority)
FBR	Federal Board of Revenue
FCC	Federal Communications Commission (US Telecom Regulator)
FDI	Foreign Direct Investment
FIA	Federal Investigation Agency
FLL	Fixed Local Loop
FNP	Fixed Number Portability
FRS	Family Radio Service
FTTB	Fiber to the Building/Basement
FTTC	Fiber to the Curb/Cabinet
FTTH	Fiber to the Home
GDP (PPP)	Gross Domestic Product (Purchasing Power Parity)
GHz	Giga Hertz
GoP	Government of Pakistan
GPS	Global Positioning System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
GST	General Sales Tax
HEC	Higher Education Commission
HFC	Hybrid Fiber Coaxial
HHI	Herfindahl-Hirschman Index
HR	Human Resources
IC	Interconnection Charges
ICN	International Competition Network
ICT	Information and Communications Technology
IDRC	International Development Research Centre
IMF	International Monetary Fund
IOT	Inter-Operability Test
IP	Internet Protocol
IPLC	International Private Line Circuit
ISD	International Subscriber Dialing
ISDN	Integrated Services Digital Network
ISM	Industrial, Scientific, Medical Band
ISI	ISI Publications
ISP	Internet Service Provider
ISPAK	Internet Service Providers Association of Pakistan
IT	Information Technology
ITU	International Telecommunication Union
IXP	Internet Exchange Point
LDI	Long Distance International
LIRNE	Learning Initiatives on Reforms for Network Economies

LL	Local Loop
LOS	Line of Sight
LPG	Liquefied Petroleum Gas
LRAIC	Long Run Average Incremental Cost
LRIC	Long Run Incremental Cost
LTE	Long Term Evolution
M	Million
M&A	Merger & Acquisition
MCA	Monopoly Control Authority
MENA	Middle East and North Africa
MHz	Mega Hertz
MMS	Multimedia Messaging Service
MNP	Mobile Number Portability
MoIT	Ministry of Information Technology (Pakistan's Telecom Ministry & 'Policy-Maker')
MoITT	Ministry of IT and Telecommunications
MoST	Ministry of Science and Technology
MRTPO	Monopolies and Restrictive Trade Practices Ordinance
MSC	Mobile Switching Center
MTR	Mobile Termination Rate
MVNO	Mobile Virtual Network Operator
NADRA	National Database and Registration Authority
NGN	Next Generation Network
NGO	Non-Governmental Organization
NIC	National Identity Card
NICTRDF	National Information Communication Technologies Research and Development Fund
NOC	No Objection Certificate
NTC	National Telecom Corporation
NWD	Nation-Wide Dialing
O&M	Operations & Maintenance
OAN	Open Access Network
OEM	Original Equipment Manufacturers
OFCOM	Office of Communications (British Telecom Regulator)
ONP	Open Network Provision
OPEX	Operational Expenditure
OPP	Obligatory Passage Point
OT	Orascom Telecom
PBX	Private Branch Exchange
PC	Personal Computer
PCO	Public Call Office
PEMRA	Pakistan Electronic Media Regulatory Authority
PERN	Pakistan Educational Research Network
PIA	Pakistan International Airlines

PIE	Pakistan Internet Exchange
PKR	Pakistani Rupee (also frequently mentioned as ‘Rs.’ as shortened form)
PM	Prime Minister
PoI	Points of Interconnection
PR	Public Relations
PSEB	Pakistan Software Export Bureau
PSTN	Public Switched Telephone Network
PTA	Pakistan Telecom Authority (Pakistan’s Telecom Regulator)
PTCL	Pakistan Telecommunication Company Ltd. (Pakistan’s Telecom Incumbent)
PTML	Pakistan Telecommunications Mobile Limited (PTCL’s Mobile Subsidiary)
PTT	Postal Telegraph and Telephone (State owned old time incumbents)
QoS	Quality of Service
R&D	Research and Development
RBOCs	Regional Bell Operating Companies
RF	Radio Frequency
RFID	Radio Frequency Identification
RIO	Reference Interconnect Offer
RoW	Rights of Way
Rs.	Rupees (Pakistani Currency - Currently Rs. 85 equals to \$1 USD)
RSS	Rich Site Summary (Online Regular Feedbacks)
SBU	Strategic Business Unit
SCOT	Social Construction of Technology
SDSL	Symmetric Digital Subscriber Line
SHF	Super High Frequency
SI	Systems of Innovation
SIM	Subscriber Identification Module
SMEs	Small and Medium (sized) Enterprises
SMS	Short Message Service
SMP	Significant Market Power
SOFDMA	Scalable Orthogonal Frequency Division Multiple Access
SST	Social Shaping of Technology
STM	Synchronous Transport Module
T&T	Telephone and Telegraphy
TELRIC	Total Element Long Run Incremental Cost
TETRA	Terrestrial Trunked Radio
TIP	Telephone Industry Pakistan
TRE	Telecom Regulatory Environment
TRAI	Telecom Regulatory Authority of India (Indian telecom Regulator)
TSLRIC	Total Service Long Run Incremental Cost
TWA	Trans-World Associates
UA	Universal Access
UAE	United Arab Emirates



U-I-G	University-Industry-Government (also called ‘Triple-Helix’)
UHF	Ultra High Frequency
UK	United Kingdom (Britain)
UN	United Nations
U-NII	Unlicensed National Information Infrastructure
URL	Uniform Resource Locator (Web Address)
US	United States (of America)
USF	Universal Service Fund
USO	Universal Service Obligations
VAS	Value-Added Service
VAT	Value-Added Tax
VCs	Venture Capital (firms)
VHF	Very High Frequency
VoIP	Voice over IP
VPN	Virtual Private Network
VPO	Village Phone Operator
VSAT	Very Small Aperture Terminal
WAPDA	Water & Power Development Authority
WCDMA	Wideband Code Division Multiple Access
WDR	World Dialogue on Regulation
WiMAX	Worldwide Interoperability for Microwave Access
WLL	Wireless Local Loop
WTO	World Trade Organization
WSIS	World Summit on the Information Society
2G/3G/4G	2 <sup>nd</sup> Generation, 3 <sup>rd</sup> Generation and 4 <sup>th</sup> Generation of Mobile Services

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## Appendix 1 – Questionnaire

### Questionnaire for End-Users of Telecommunication Services

Project No. UK 10 – 15538

Researcher: Abdullah Ismail (PhD candidate at Technical University of Denmark, DTU)

Advisor: Prof. Christian Clausen (Professor at DTU/SDU)

Field supervisor: Dr. Joseph Wilson (Member of Competition Commission of Pakistan - CCP)

#### Personal Details\*

1. Name: -----
2. a) Age ----- b) Gender (M/F) ----- c) Date -----
3. a) Occupation ----- b) Income (Rs.) -----
4. a) Work city ----- b) Residential city -----
5. Contact:
  - a) Landline ----- b) Mobile -----
  - c) Fax ----- d) Email -----
  - e) Website -----

\* All the provided data will be kept strictly confidential and will only be used for research purposes. Please leave the spaces blank in this questionnaire where the questions do not apply to you (or are deemed irrelevant).

#### Current Research in a Nutshell

The development of telecommunication services in Pakistan, particularly in past two decades, presents interesting results. On the one hand, a rapid growth in number of mobile subscribers has been observed which surged from just 5 million (in 2004) to now more than 109M (est. June 2011). On the other hand, the number of fixed/landline telephone subscribers is still around 6 million (including WLL subscriptions) and there has been negligible growth in fixed-line subscribers during last couple of decades. There has been observed a gradual decline both in the number of public payphones (telephone booths or calling centers) and the number of fixed phone subscribers. Finally, the internet is also not showing any positive sign of growth as we have experienced in case of mobile phone, and the number of broadband internet subscribers still stands below 1.4 million. However, the broadband wireless technology WiMAX has been recently launched with heavy investment in building its countrywide infrastructure but its success or failure is still under the question mark. In light of the above presented facts and statistics, the research question to be investigated is to understand the reasons and critical factors behind the success and failure of the diffusion of any particular telecommunication technology or service. The current questionnaire would help to understand the perspective of end-users (consumers) on this issue. The users' opinion will only reflect one dimension of this multidimensional debate where almost all the major telecom actors (stakeholders) will be engaged to collect their differing (and often conflicting) perspectives on different issues. The outcome of the current research will be equally useful for UN (and its relevant agencies), government (and its policy institutions and regulatory bodies), telecom network operators and service providers, entrepreneurs and investors, consultants and academic researchers and finally the telecom users and society in general. Your contribution to this research through filling this questionnaire would be highly appreciated. It should take in average 20-30 minutes to fill out this questionnaire.



## Part 1      General Service Inquiry

1. What telecom services are currently in your use?

Fixed/landline (home) ----- Fixed/landline (work) ----- Public payphone (booth/calling center) -----

Mobile (personal) ----- Mobile (work) ----- Fax ----- Internet (work/educational institute) -----

Internet (home) ----- Internet (net café) ----- Other -----

2. Which services you would still prefer to be subscribed for at home as well if you were already provided with their usage facility within your office vicinity during work hours? Prefer first to subscribe = 1, Last = 3

Fixed/landline (home) ----- Mobile (personal) ----- Internet (home) -----

3. Do you have a monthly subscription (monthly billing from operator) or prepaid card connections?  
Monthly subscription = M, Prepaid card connection = P

Fixed/landline (home) ----- Mobile (personal) ----- Internet (home) -----

4. During past two years how many times have you switched your fixed/landline and mobile operators (not numbers), and Internet service provider (ISP)?

Fixed/landline Operator ----- Reason -----

Mobile Operator ----- Reason -----

Internet service provider ----- Reason -----

5. During past two years how many times have you applied for new fixed/landline phone number and how many times have you switched/changed your mobile phone numbers?

Fixed/landline ----- Reason -----

Mobile ----- Reason -----

6. How many mobile SIM cards or mobile phone numbers do you keep in average at a time? -----

Reason for keeping more than one mobile SIM cards -----

7. How much amount (in rupees) monthly do you spend (in average) on different telecom services?

Fixed/landline (home) ----- Mobile (personal) ----- Internet (home) -----

8. If you have restricted budget (limited monthly budget to be spent on telecom services) and can only subscribe for one service at a time, please mention in chronological order which services you would highly prefer to be subscribed for first? Firstly (subscribe for) = 1, Secondly = 2, Lastly = 3

Fixed/landline (home) ----- Mobile (personal) ----- Internet (home) -----

9. How much are you satisfied with the services you are already using?

Fully satisfied = 1, partially satisfied/dissatisfied = 2, completely dissatisfied = 3

Fixed/landline (home) ----- Mobile (personal) ----- Internet (home) -----

## Part 2

10. In case, if you are already using or planning to be subscribed for following services then please mark the reasons for your adoption/use of any particular service in a scale 1-5 where  
Most important reason = 1, Average important reason = 3, Least important reason = 5

### 10(a) Fixed/Landline Telephony

1. For fun/entertainment -----
2. For interpersonal communication and strengthening the social relationships -----
3. For learning and education -----
4. For professional requirements -----
5. For news/information -----
6. For representing the use of fixed telephone/cordless as a social status symbol -----
7. For the fear of being socially isolated if not adopted/used these devices/technologies (since the other friends and relatives are already using or soon going to adopt these services) -----

### 10(b) Mobile Telephony

1. For fun/entertainment -----
2. For interpersonal communication and strengthening the social relationships -----
3. For learning and education -----
4. For professional requirements -----
5. For news/information -----
6. For representing the use of mobile (and its applications) as a social status symbol -----
7. For the fear of being socially isolated if not adopted/used these devices/technologies (since the other friends and relatives are already using or soon going to adopt these services) -----

### 10(c) Internet (using Desktop/stationary PC or Laptop/portable PC)

1. For fun/entertainment -----
2. For interpersonal communication and strengthening the social relationships -----
3. For learning and education -----
4. For professional requirements -----
5. For news/information -----
6. For representing the use of computer/laptop and internet as a social status symbol -----
7. For the fear of being socially isolated if not adopted/used these devices/technologies (since the other friends and relatives are already using or soon going to adopt these services) -----

## Part 3

11. In case

- If you do not use or currently not being subscribed to one of the following three categorized services, OR
- If you are already in use or subscribed to one of these services but not fully satisfied,

Then please mention your ***reasons for not using a particular telecom device or service / being not yet subscribed for a service*** or the ***reasons for your dissatisfaction*** in the following order with respect to their relative importance?

Please mark the reasons for your dissatisfaction or not using a particular service in a scale 1-5 where Most important reason = 1, Average important reason = 3, Least important reason = 5

\* You can also place the number 2 and 4 to any category if you think that a reason lies in between the above mentioned three scales e.g. place number 4 for a reason what you think is not the most important but is of above average importance & similarly number 2 for a reason in between the average & least important reason.

11(a) Fixed/Landline Telephony (home)

1. I'm afraid of and feel uncomfortable using fixed telephony -----
2. Higher prices -----
3. Poor/Bad quality of service (QoS) -----
4. Wrong billing or lack of transparency/clarity in offered services vs. billing -----
5. Bad customer services from telecom operators (at office/on phone/online) -----
6. Unacceptable delays in getting fixed-line connection due to unnecessarily long application processing time and bureaucratic procedures -----
7. Administrative mismanagement and corruption cases -----
8. Privacy factor (e.g. fear of your calls/talks being intercepted, recorded, listened or monitored by others) -----
9. Moral/ethical issues (Misuse/abuse of services e.g. malicious/wrong calls, unnecessarily long chitchat on phone) -----
10. Technological barrier (less understanding/awareness about the device/technology and its usage) -----
11. Application barrier (not really relevant/useful or critically important in my daily life activities) -----

Other reasons (please mention here) -----

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11(b) Mobile Telephony (personal)

Please mention your *reasons for not using / being not yet subscribed* or the *reasons for your dissatisfaction* in following order with respect to their relative importance?

Please mark the reasons for your dissatisfaction or not using a particular service in a scale 1-5 where Most important reason = 1, Average important reason = 3, Least important reason = 5

\* You can also place the number 2 and 4 to any category if you think that a reason lies in between the above mentioned three scales e.g. place number 4 for a reason what you think is not the most important but is of above average importance & similarly number 2 for a reason in between the average & least important reason.

1. I'm afraid of and feel uncomfortable using mobile phone -----
2. Higher prices -----
3. Poor/Bad quality of service (QoS) -----
4. Wrong billing or lack of transparency/clarity in offered services vs. billing -----
5. Bad customer services from telecom operators (at office/on phone/online) -----
6. Unacceptable delays in getting mobile connection/activation due to unnecessarily long application processing time and bureaucratic procedures -----
7. Administrative mismanagement and corruption cases -----
8. Privacy factor (e.g. fear of your calls and text messages being intercepted, recorded, listened or monitored by others) -----
9. Moral/ethical issues (Misuse/abuse of services e.g. malicious/wrong calls, spam text messages, unnecessarily long chitchat on phone) -----
10. Health hazard ( a general perception/fear that the use of mobile phone could be dangerous for health e.g. risk of brain tumor if used extensively due to proximity with electromagnetic radiations) -----
11. Technological barrier (less understanding/awareness about the device/technology and its usage) -----
12. Discharged mobile (often not being charged because of frequent power breakdown / load shedding) -----
13. Application barrier (not really relevant/useful or critically important in daily life activities -----

Other reasons (please mention here) -----

-----

-----

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-----

11(c) Internet (using Desktop/stationary PC or Laptop/portable PC)

Please mention your *reasons for not using / being not yet subscribed* or the *reasons for your dissatisfaction* in chronological order with respect to their relative importance? Please mark the reasons for your dissatisfaction or not using a particular service in a scale 1-5 where  
Most important reason = 1, Average important reason = 3, Least important reason = 5

\* You can also place the number 2 and 4 to any category if you think that a reason lies in between the above mentioned three scales e.g. place number 4 for a reason what you think is not the most important but is of above average importance & similarly number 2 for a reason in between the average & least important reason.

1. I'm afraid of and feel uncomfortable using computer and working with internet -----
2. Higher prices -----
3. Poor/Bad quality of service (QoS) -----
4. Wrong billing or lack of transparency/clarity in offered services vs. billing -----
5. Bad customer services from telecom operators (at office/on phone/online) -----
6. Unacceptable delays in getting internet connection due to unnecessarily long application processing time, technical issues and bureaucratic procedures -----
7. Administrative mismanagement and corruption cases -----
8. Privacy factor (e.g. fear of your internet voice calls, text messages, emails and web-surfing history is being intercepted, filtered and monitored by others, fear of not sharing family photos through internet) -----
9. Moral/ethical issues (Misuse/abuse of services e.g. less useful/harmful contents on internet, spam emails/text messages, unnecessarily long chitchat on internet (at chat rooms) causing wastage of time) -----
10. Lack of trust in e-transactions e.g. online purchasing (e-commerce) & billing/payment (e-banking) through internet due to fear of fraud and privacy violation (misuse of credit card information) -----
11. Language barrier (availability of content in English vs. local languages) -----
12. Technological barrier (less understanding/awareness about the device/technology and its usage) -----
13. Application barrier (not really relevant/useful or critically important in daily life activities) -----
14. Social & health hazards – a general perception that an intensive usage and interaction with TV/computer e.g. consistently playing computer/online gaming, frequently watching video movies/cartoons, loud listening of music, exhaustive chatting on internet may have negative side-effects particularly in case of kids' eyesight, audibility, their focus on studies and on their social interaction and physical activities -----
15. Inability (too much disturbance) to work with computer/internet due to excessive load-shedding -----

Other reasons (please mention here) -----

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-----

## Part 4      Service Utilization Frequency

12. Please mention which of the following telecom/ICT devices or services and their different applications are already in your use and how frequently you use them, considering the following order?

Frequently/daily = 1, Weekly = 2, Monthly = 3, Yearly (rarely) = 4, Never used = 5

1. Documentation – working with Office programs (e.g. Word/PowerPoint/Excel) -----
2. Data management within ‘files’ and ‘folders’ on computer or any other digital device -----
3. Landline voice call (fixed telephone) -----
4. Mobile voice call -----
5. VOIP (internet voice call) -----
6. Audio/video conferencing through phone or internet -----
7. Faxing -----
8. Text messaging (SMS) -----
9. Multimedia messaging (MMS) -----
10. E-mailing -----
11. Web-browsing/surfing web pages -----
12. Using Internet search engines (e.g. Google) and online encyclopedia (e.g. Wikipedia) -----
13. Online newspapers (reading news papers on internet) -----
14. Online gaming (playing games on internet) -----
15. Online filling applications and online polling/voting -----
16. Downloading and Sharing/Uploading files using internet -----
17. Chatting (e.g. at msn/yahoo), discussion forums -----
18. Making pictures or movie/video clip through mobile camera -----
19. Transferring data files (audio, video, picture, text) between any of the following digital gadgets e.g. PC/laptop, mobile, PDA, iPod/MP3, MPEG-4 & memory devices (e.g. CD/DVD/flash) -----
20. Mobile TV -----
21. Mobile radio (listening radio broadcasting on mobile) -----
22. Mobile MP3 player (playing music or any other audio file on mobile) -----
23. Mobile gaming (playing video games on mobile) -----
24. Mobile Internet (internet service availability on mobile or laptop through cellular mobile network while roaming/traveling) -----
25. Wireless internet through Wi-Fi or WiMAX network -----
26. Mobile video telephony (video call between subscribers using 3G mobile if launched) -----
27. Internet TV (IP TV) -----
28. Short range communications (e.g. RFID tags, infrared/IrDA, Bluetooth etc.) -----
29. Electronic purchasing/payments/transactions (E-commerce) -----
30. Mobile purchasing/payments/transactions (M-commerce) -----
31. Home office through VPN connection -----
32. Other (mention here) -----

## Part 5 Impact Analysis and Recommendations

13. To what extent, using above-mentioned telecom devices, services and applications have impacted on your professional performance (efficiency and quality of work) and social attachments/bonding with your friends and relatives?

Radical/very high (impact) = 1, Considerably high impact = 2, Reasonable/average impact = 3,  
Low impact = 4, No impact = 5

Learning and education -----, at work/job -----, social relationship -----, daily life activities -----

14. Please also mention if there is any negative impact of the increased usage of these communication devices/services on the strength/quality of your social relationship (e.g. a gradual shift from face to face meeting to telephonic conversations to emailing/text messaging?)

-----  
-----

15. To what extent, the use of above-mentioned telecom devices, services and applications have economically and politically empowered (enhanced/increased) your participation in the society?

Radical/very high (impact) = 1, Considerably high impact = 2, Reasonable/average impact = 3,  
Low impact = 4, No impact = 5

Economic impact (earning and spending) -----, Political impact (awareness and participation) -----

16. Do you trust the government and its policy institutions/regulatory bodies as fully concerned and committed to protect your consumer rights and to speak on your behalf strongly to deal with various consumer issues?

Fully trust = 1, partially trust = 2, don't trust = 3

Fixed telephony -----, Mobile telephony -----, Internet -----

17. What measures do you suggest/recommend to be considered by different telecom actors (any institution/organization that can influence and help in bringing change in telecom sector) in order to improve their efficiency, capability, competence and commitment to the rapid and smooth development and diffusion of telecom services within Pakistan?

17(a) Recommendations for Government, policy institutions and regulatory bodies

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-----

17(b) Recommendations for telecom operators and service providers

-----  
-----

17(c) Other comments or recommendations

-----  
-----



## Appendix 2 – An Investment Proposal for the Banks

To: Mr. -----  
Head Operations & Support Division  
----- Pakistan.

From: Abdullah Ismail  
DTU Management Engineering -  
Technical University of Denmark  
Date: December 5<sup>th</sup>, 2009

### An Investment Proposal for ----- Bank

Project Title: Micro-Financing Scheme for University Students in Pakistan to Own Laptops

A Brief Introduction: The project proponent (Abdullah Ismail) is conducting his PhD field research on the topic ‘The Diffusion pattern of telecom/ICT services in Pakistan’ as case study since September 2009. As part of this research program, the field research has been designed to collect the empirical data through interviews, questionnaires, workshops, discussion forums, observations and through collection of research papers/reports by meeting range of stakeholders and different interested groups such as telecom industry players (vendors, operators, dealers/distributors, consultants), academic institutions (primarily universities), financial institutions (banks, venture capital firms), NGOs and relevant public institutions (like ministry/MoIT, regulator/PTA, competition authority/CCP).

#### Vision and Motivation for the Proposed Project

During the field research in Pakistan, a great discrepancy has been observed in the usage (teledensity) of mobile telephony (above 60%) when compared with the usage of computers (particularly laptops) and internet services (below 3%) among Pakistani citizens. The primary reasons found for this variance between the above mentioned two comparative products/services were the factors like affordability, literacy rate, usability/utility, mobility, connectivity, privacy and morality. These issues were discussed around 6 universities across Pakistan during the workshops and interviews with the university students, teachers and administrators intensively to find the core reasons for comparatively such low penetration and usage of internet and laptops particularly among the university level students. The current research finds out that the ‘literacy factor’ is an irrelevant issue in this particular case (since here the laptop and internet diffusion is being discussed in context of university students), while it finds ‘affordability’ and ‘connectivity’ as the most critical factors for the relatively low diffusion of laptops and internet within universities. Keeping the above facts in mind, the researcher is motivated to find a solution for this problem through bridging and coordinating between the five major stakeholders namely the university students (targeted market), University administration, Laptop vendors/dealers, Wireless Internet service providers (WISP) or broadband operators, and the bank itself. After having discussion with all other stakeholders, a high degree of willingness and enthusiasm has been found in promoting this noble initiative and hence the proposal has been put forwarded to your desk for consideration.

### Interest Alignment between the Relevant Stakeholders

Despite the high demand of laptops and internet services in university premises, the primary reason for not being able yet to tap this existing demand has been frequently referred to the lack of communication and coordination between the relevant stakeholders, which eventually ends up in the debate circulating around the issues like lack of resources and professional competencies/technical expertise, lacking social capital (lack of mutual trust, confidence, common vision, negative attitude, cultural barriers, uncertainty), lacking sincerity and commitment (devotion, dedication), lacking managerial efficiency (lack of interest, mismanagement and corruption), and lacking public and private sector support and active participation. In order to address these issues and to effectively tackle with these mounting barriers, the researcher is motivated to bring these stakeholders on a common platform/channel by aligning their interest with a common vision and joint initiative. To elaborate it further, the following scenario is presented.

The university students (targeted customers) are willing to buy a laptop for enhancing their efficiency and performance level in their learning and education through accessing world-wide e-libraries and research databases, and participating in distant learning (e-education) and virtual training programs through online education and video conferencing. The University academics and administration also want to help students achieving their goals to make their campuses fully connected and interactive with rest of the information world. The university is willing to be engaged with different research programs and ‘communities of practices’ (professional groups) across Pakistan and worldwide. The university administration is also interested to implement the project of ‘web-based course management’ which would help enhancing the quality of education and efficiency of learning activities across the campus. The government is generally willing to help and support such initiatives targeted at moving towards an ‘information society’. The ISPs (WISP or broadband wireless operators) and vendors (dealers) are also keen to tap the market potential by facilitating and promoting their products and services in these emerging and promising markets. Finally the banks (financial institutions) would have high incentive in engaging with this initiative in three different ways. First, all those students willing to buy laptops (with university guarantee to payback the installments within scheduled time) would have to open accounts in the bank which would facilitate the micro-financing scheme, hence bringing their other active transactions also to this particular bank. Secondly, the bank would be getting a fixed return or set margin on the issued amount of loans as agreed before hand with the customers. Thirdly, the designated bank would get renowned for its participation in this noble cause of making the society an ‘information society’ as we have observed in the well-known and famous case of Grameen bank’s success story in creating small entrepreneurial opportunities through connecting the rural communities of Bangladesh through facilitating the micro-financing schemes and soft loans in collaboration with the economist Dr. Younas (Nobel-Prize winner).

A Sample Product with described Value Chain: A case of sample laptop with the proposed stakeholders engaged in the value delivery chain has been mentioned here for your review.

Product Specification: HP/COMPAQ PRESARIO CQ40-304TU (Dual Core T3400, 2.16GHz), RAM 1GB, Hard Drive 250GB, DVD/RW, Display 14.1", WiFi, Blue-tooth, Web cam, DOS Operating System (with 1 year service-support warrantee)

Dealer Price: 56,000 Rs. (including all taxes) – ACER laptops are also provided around the same price with similar specifications. The Products with higher specifications like 2GB RAM, with bigger display, licensed windows operating systems or DELL systems are available at around 10% price increment.

Targeted Customers: MBA, IT and Engineering students enrolled at recognized Universities

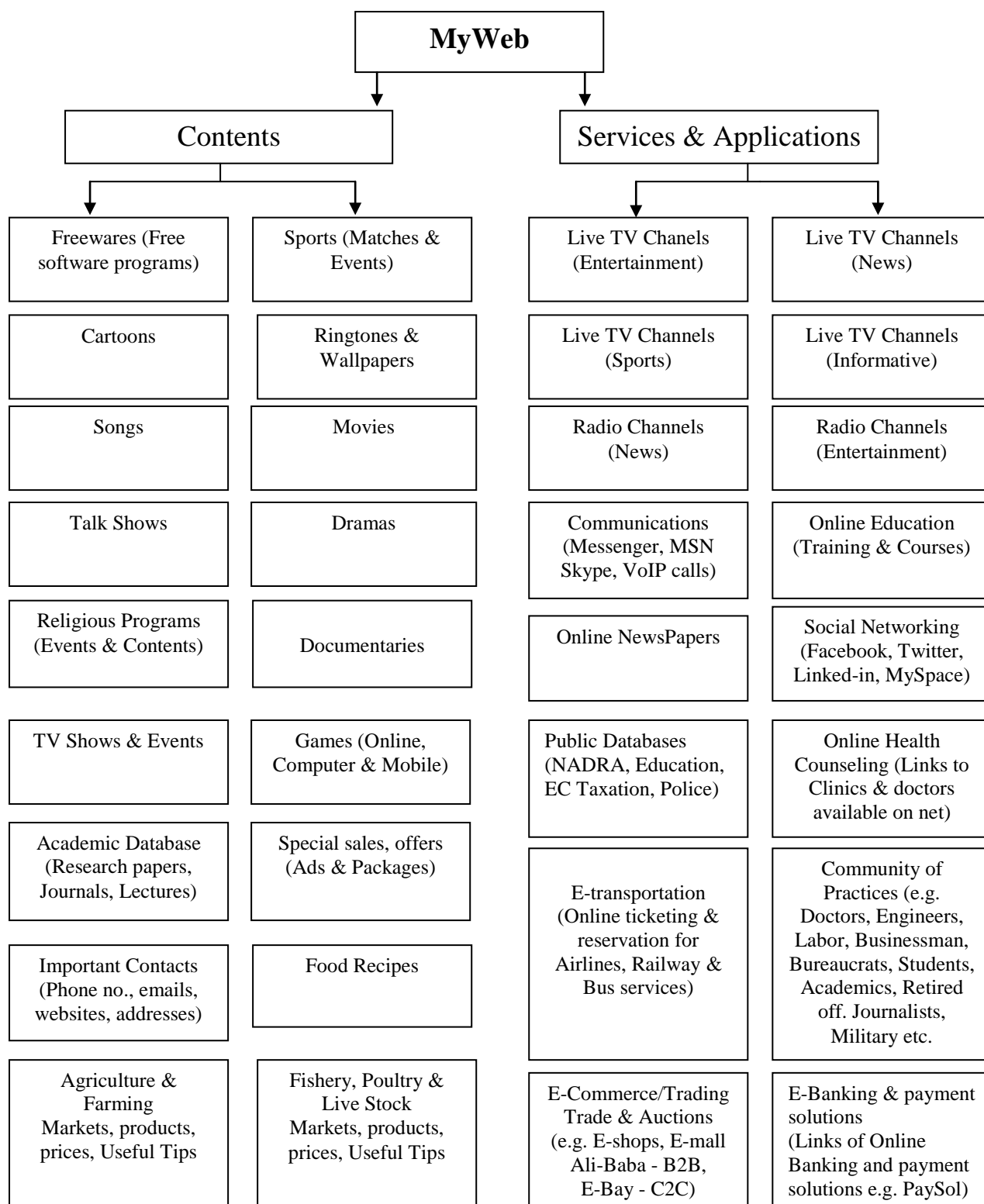
The primary reason for initially engaging only MBA, IT and engineering students is because of their educational relevance and high degree of dependence on the usage of laptop and internet for their education. The other important reason is that these programs are in high demand and often require some self-financing (depositing a refundable lump-sum amount when all the bills and liabilities are cleared after completing the study program) and the students are unlikely to quit the program without having received their final degree from the administration.

Dealer Profile: ----- is a Pakistan based computer dealer which is specialized in delivering laptops and other computing systems at competitive prices with all other associated IT products including 1 year service warrantee. The dealer is in market for several years serving other major clients as well along with establishing IT training centers across Pakistan. The dealer is also a channel partner and associate member of 'Intel' in Pakistan.

#### The Transaction Process in the proposed Value Delivery Chain

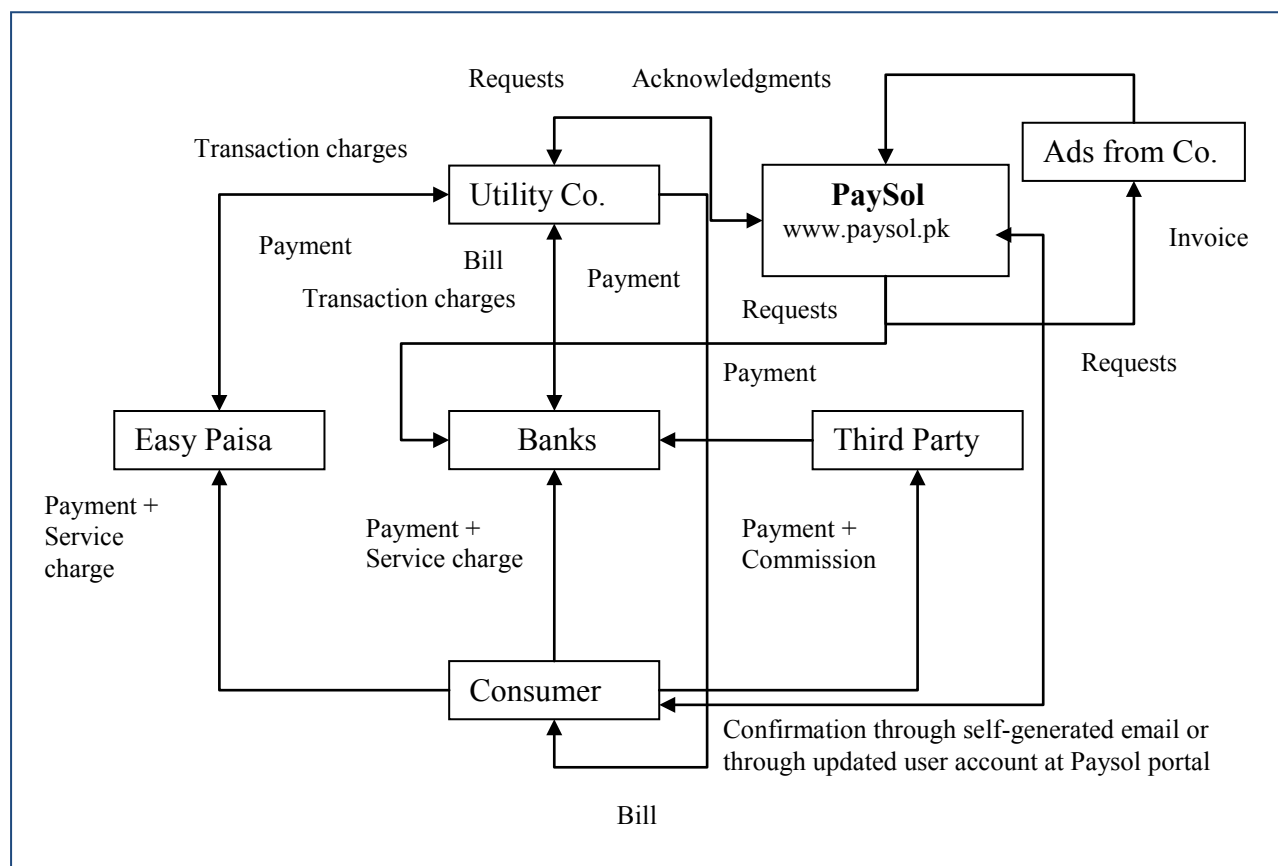
- The University will advertise the scheme to the targeted group of students with necessary terms and conditions. The University will provide the guarantee for full payment of loaned amount within scheduled time (or installments) through keeping a security deposit from students at the time of admission or through holding their degrees until all the payments are made as would be verified by the 'bank acknowledgment certificate'.
- The University will forward the case (application) to the dealer with the required data and documents. The dealer will make the final invoice based on the required product specifications (including all the taxes) to the bank for further processing.
- The bank will add its service charges (or fixed margin) on top of the invoiced price, and handover to the customer to be agreed upon the payment terms and conditions. The loan will be approved after getting the client's signature on loan documents and the invoiced money will be paid to the dealer through its business account in the designated bank.

### Appendix 3 – A Proposed ‘Content Aggregator’ Web-Link Solution



Source: Author

## Appendix 4 – The ‘Paysol’ Business Model



Source: Author

### Stakeholders

Utility companies: Electricity, Gas, Water, Taxation, PTV, Cable TV, Fixed phone, Mobile phone, Internet, PIA/Railways

‘Easy Paisa’: This is a bill payment service, initially offered by a mobile operator; but later the business model was copied by other mobile operators and the banks as well. The service facilitates any bill payer (no matter if he/she holds an account or keeps the subscription or not) to pay their bills at thousands of the local shops located everywhere across the country with the help of mobile service; and hence getting confirmation by receiving text messages immediately. However, the bill payer has to be in person in one of those shops, since it is still considered to be a manual process. If the bank comes on the forefront to play the major role in this bill payment business model, then the mobile operators are paid commission for their supporting service; but their role then remains behind the screen. On the contrary, if the mobile operators decide to play the leading role in this bill payment process using the local shops, then the banks may be either totally excluded (bypassed) from the bill payment process, or may be only marginally engaged on the commission basis. Surely, the transaction paths would not remain the same in both of the above mentioned cases, and in case where the bank takes the lead (such as in the ‘Omni’ service), then the payments are likely to move

directly from the shops to the banks; whereas the bills and commission are supposed to be subsequently paid to the utility companies and the mobile operator afterwards.

Banks: Any bank where consumer holds an active account not necessarily an online account

Third Party: Any third party manual or physical service of bills collection & payment at homes

PaySol: How the proposed PaySol system will create additional value for customers?

The PaySol billing and payment solution would facilitate a consumer to pay his monthly utility bills using its software solution. The bills can be made to be automatically paid from the user's account through his bank to the respective utility companies if the user subscribe for that service with signed approval on a document received through post. In that authorization document, the user would authorize PaySol to access and acquire his billing details to be shared with his bank so the monthly bills be paid automatically at a fixed date each month to avoid any complications regarding payment or paying any surcharges/fines in case of delayed payments. The subscriber may anytime submit a request for withdrawal of a particular payment (unwanted bill) or to stop paying any specific utility company by unsubscribing from the automatic payment service. There will be following steps in this transactional process.

- 1) After receiving the request/query, PaySol would immediately send the potential clients a contract paper (three copies) mentioned with all the terms and conditions clearly, which the client would have to agree with after signing the contract. The user copy would be kept with user while the other two copies will be sent to PaySol. PaySol will send one copy to the respective bank while the second copy will be kept at record for reference. If utility company required the user authentication to access to his billing details then the record copy will be scanned and printed for utility companies.
- 2) The utility companies will create a user account for our individual client (or for the client's household connection, depending on the nature of utility service) or can use an already created user account for the purpose of automatic monthly bill payment service. The utility company will issue an individual 'reference number' for each bill so that the receipt of each bill could be acknowledged automatically through a software based auto generated message sent to user email account say at [www.paysol.pk/paysol/user-5648](http://www.paysol.pk/paysol/user-5648).
- 3) After receiving the acknowledgement from the utility companies for the receipt of a bill, a self-generated email (to user email account) or a message (to the PaySol's user blog say at [www.paysol.pk/paysol/blog/user-5648](http://www.paysol.pk/paysol/blog/user-5648)) will be sent. The user payment database will be updated accordingly automatically through software in an Excel sheet. The Excel sheet will mention the utility company name, bill reference number, paid amount, date of payment, payment status (such as pending, paid, acknowledged, to be paid at date ... etc.).
- 4) The primary source of income for running that website will be coming from the marketing advertisements (ads) received from different enterprises primarily from the big cluster of these utility companies themselves. Once the critical mass was achieved, say 100,000 users (active subscribers and regular site visitors) in context of Pakistan with only 1 million broadband subscribers, then a nominal subscription fee may have been surcharged to create an additional source of revenue.

## Appendix 5 – A Brief History of the Telecommunications Sector of Pakistan

Note: The information provided in Appendix 5 is a slightly edited version of the document originally delivered by PTCL on request of the author. The Author thanks to PTCL for this support and showing courtesy.

### *A Brief History*

After the partition of Indian Subcontinent in 1947, the telecommunication assets within Pakistan were separated from the Indian Post and Telegraph Department and renamed as Pakistan Post & Telegraph (“PP&T”) Department. In 1962, the operations of the PP&T Department were streamlined to create the Pakistan Telephone & Telegraph (“PT&T”). In 1991, this department was included as part of the Government’s privatization agenda and several measures were taken to prepare the department for eventual privatization, including the initial corporatization of the department into Pakistan Telecommunication Corporation (“PTC”) and its subsequent full corporatization into PTCL in 1996, whereas it was granted that time a 25-years’ operational license.

The regulatory framework of Telecommunications in Pakistan traces back its origin in the Telegraphy Act of 1876, which was promulgated by the British Government. Upon its independence in 1947 from the British Empire, Pakistan inherited and adopted the British legal system including the Telegraphy Act of 1885. The main objective of the Telegraphy Act of 1885 was to give power to the Government, and to any company or person licensed to provide telecommunication services under the Telegraphy Act of 1876, to place and maintain telegraph lines and posts under and over the property of any person whether private or public bodies. The Telegraphy Act of 1885 empowered the Federal Government to control establishment, maintenance, and working of telegraphs which also included the wireless apparatus.

### *Regulatory Overview:*

In 1994, the Government of Pakistan (GoP), through the 1994 Ordinance, defined its policy for the future development of the telecommunications sector in Pakistan. The telecommunications regulatory framework in Pakistan is underpinned by the Act which came into force on 17 October, 1996. The Act gives the provision for the re-organization and regulation of the telecommunications sector in Pakistan and establishes PTA, PTCL, NTC and the FAB. Section 58 of the Act provides that the Act is to override any law containing provisions inconsistent with the Act and in particular the Act overrides the Telegraph Act, 1885 and the Wireless Telegraphy Act, 1933.

The Ministry of Information Technology published its ‘De-Regulation Policy for the Telecommunication Sector’ in July 2003. The Deregulation Policy opened the fixed line market to competition and intended to increase service choice, promote infrastructure development (including increasing penetration and expansion to underserved areas), increase private investments in the sector, liberalize the telecommunication sector by encouraging fair competition, maintain an effective regulatory regime, being consistent with the national IT and internet promotion policies, and safeguard the national and security interests. The De-Regulation policy proposed two types of licenses for fixed line operators for the licensing periods of 20 years, with the possibility for any



operator to hold both licenses. Tariffs for both types of licenses are unregulated until SMP status is achieved by any operator. However, PTA reserves the right to intervene in the case of burdensome and unfair pricing to subscribers.

### ***Rights and Obligations for the LL and LDI Licenses***

#### Local Loop (“LL”) fixed line telecommunications within a PTCL region:

These licenses are available on an unrestricted and open basis. Licenses are granted for a fee of US\$10,000 for anyone eligible under the licensing requirements. Some of the main rights and obligations of an LL licensee are highlighted:

Rights of an LL Licensee:

1. Right to contract for the ‘Rights of Way’ needed to construct their networks
2. Right to co-locate in PTCL local and transit exchange buildings and to connect their own fiber and radio links to PTCL buildings
3. Right to geographic and non-geographic numbering ranges and short codes for operator services

Obligations of an LL Licensee:

1. One point of interconnection within the prescribed period in each licensed PTCL region where they operate
2. Provide free directory assistance to its own customers, emergency service, operator assistance and other similar support services
3. Obligation to offer Indirect Access (carrier selection) only applies if determined to have SMP

#### Long distance and international (“LDI”) fixed line telecommunication:

These licenses are also available on an unrestricted and open basis to anyone who meets the licensing requirements. Licenses were granted for a fee of US\$ 500,000 for anyone eligible under the licensing requirements, which include technical and financial capabilities, experience to meet rollout obligations. A licensee must post a performance bond of US\$ 10 million in respect of its infrastructure and roll out targets. Licenses were awarded followed by an open public hearing process. Some of the main rights and obligations of an LDI licensee are illustrated below:

Rights of an LDI Licensee:

1. Right to contract for the ‘rights of way’ needed to construct their networks
2. Right to co-locate in PTCL local, transit and international exchange buildings and to connect their own fiber and radio links to PTCL buildings
3. Right to non-geographic numbering ranges, short codes for operator service and four digit access codes for indirect access
4. Right to sub-lease half circuit capacity on SeMeWe-3 submarine cable, and to obtain IRUs on commercial terms
5. Right to participate in future landing points for new submarine cables

Obligations of an LDI Licensee:

1. One point of interconnection in 5 of PTCL regions within one year of award of license and in all 13 regions within 3 years
2. Licensee will need to own 10% of the network in year 1, rising to 30% in year 2 and 50% in year 3 measured in 2 Mbit/s x km. (A long term lease of 5 years or more can be substituted for ownership)

### *A Brief Introduction of Regulator, Frequency Board and Fixed Line Incumbent*

#### Pakistan Telecommunication Authority (PTA)

PTA was established by Section 3 of the Act and regulates the establishment, operation and maintenance of telecommunication systems and the provision of telecommunication services in Pakistan. PTA has the power to grant and renew licenses for the establishment, operation and maintenance of telecommunication systems or for the provision of telecommunication services, to monitor and enforce licenses and to modify licenses. PTA is required to receive and expeditiously dispose of applications for the use of radio spectrum and is empowered to grant licenses for the use of spectrum. PTA must refer applications for the use of radio spectrum to the FAB within a period of 30 days. PTA is empowered by Section 5(2)(o) of the Act to issue regulations for exercising its powers and performance of its functions. The regulations must not be inconsistent with the Act or rules issued under the Act.

#### Frequency Allocation Board (FAB)

Section 42 of the Act provides for the establishment of Frequency Allocation Board. With the establishment of the Board, the Pakistan Wireless Board stood dissolved and its functions were taken over by the Board. The Board has exclusive rights to allocate and assign portions of the radio frequency spectrum to the Government, service providers, telecommunications system providers, radio and television broadcasters, and public and private wireless operators. However, an application for allocation and assignment of radio frequency spectrum is first made to the Authority, which refers the application to the Board after making such inquiry as it deems fit. In exercise of its powers, the Board seeks guidance from the applicable recommendations of the International Telecommunication Union (ITU), its organs, and other international bodies.

#### National Telecommunication Corporation (NTC)

Section 41 of the Act provides for the establishment of National Telecommunication Corporation (NTC), a body corporate. NTC officially came into being on January 1, 1996 and is granted a license by the Authority on a non-exclusive basis to provide telecommunication services within Pakistan to the armed forces, defense projects, Federal Governments, Provincial Governments, or such other Governmental agencies and public institutions, as the Federal Government may determine. NTC is not allowed to sell its capacity on the telecommunication system to any person other than the Government agencies.

### Pakistan Telecommunication Company Limited (PTCL)

Section 34 of the Act provides for the establishment of Pakistan Telecommunication Company Limited. The Company was incorporated as public company under the Companies Ordinance of 1984, and officially came into being on January 1, 1996. The principal object of the Company is to provide domestic and international telecommunications, and related services consistent with the provisions of the Act. Initially, all shares of PTCL were issued to, or held in trust for, the President of the Pakistan. Indeed, the Act was promulgated with a view to sell and/or transfer shares of the Company to private investors and general public. A larger portion of the market shares of PTCL were bought by Etisalat, in 2006, who now manages PTCL.

PTCL is the largest telecommunications service provider in Pakistan offering fixed-line services throughout the country, as well as providing cellular and internet services. PTCL provides a public switched telephone network that delivers fixed-line telecommunications services to over 98% of current residential and corporate customers served in Pakistan. The network provides coverage throughout the country, and recently it obtained license to operate in Azad Jammu & Kashmir (“AJK”) and Northern Areas (“NA”) as well. PTCL operates through its own state-of-the-art nationwide fiber optic backbone, digital exchanges and long-distance telephone transmission system that work in compatibility with the international gateways. Apart from its fixed line business, PTCL also provides cellular communication services through Pakistan Telecom Mobile Limited (“PTML”) which is a wholly owned subsidiary of the Company. PTML (Ufone) is the third largest cellular operator in Pakistan. PTCL also manufactures telecommunication equipment, with sales and service being provided through Carrier Telephone Industries (“CTI”) and Telephone Industries of Pakistan (“TIP”). PTCL is listed on all three stock exchanges of Pakistan. The Government of Pakistan has the majority ownership in PTCL.

## About Author

Abdullah Ismail has born and lived in Pakistan until he completed his bachelor in electrical engineering from BUET (Pak). During this period, he closely observed and experienced some harsh social, political and economic realities and complexities as largely involved in the Pakistani society. This background has always inspired him to improve his understanding and learning; and thus contribute to bringing essential reforms in the existing systems and practices, and the prevailing norms and values of the society, particularly within his own professional discipline. Therefore he completed his higher education from renowned Danish Universities namely: Technical University of Denmark (DTU) and Aalborg University (AAU), and thus received two master degrees in Telecommunications (management) and Economics & Business Administration (MBA) from the above mentioned academic institutions respectively. Followed by that, he completed his PhD in ‘Diffusion of Telecommunications Services in a Complex Socio-Economic Context’ from DTU (Management Engineering) in June 2011. The current book is an extensively revised version of his PhD thesis, essentially aimed at making it further appealing for a larger pool of readers. The author has also experienced teaching as Assistant Professor in DTU within the international graduate study program during 2008-09. Recently, he has been appointed as Assistant Professor in College of Business Administration (CBA) at King Saud University (KSU) Riyadh. In parallel, he is also attached with consulting practices in association with a European consulting firm.

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This research identifies major attributes of the successful diffusion of telecommunications services in a complex socio-economic and political context. The contextual elements include a high degree of uncertainty and instability, lack of transparency and explicitness, and dealing with confusing translations of a wide range of actors with conflicting interests. The study explores major bottlenecks that significantly impede rapid and smooth diffusion of telecom services. It also unfolds a unique perspective on diffusion analysis by comprehensively mapping out the telecom services' markets within the five major domains namely: the user, policy, regulatory, supplier and supporting domains. Furthermore, relative impacts of the compared telecom services have been assessed from social, academic, bureaucratic, political and economic perspectives. Finally, the author makes strategic and policy recommendations for the relevant telecom suppliers, regulators and policy makers; so that the provided strategic roadmap and policy framework could ensure the successful diffusion of telecom services in a complex unit of adoption.

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